ENGINEERING NEWS-RECORD

JUNE 22, 1961

PRICE 50 CENTS

CONTENTS ON PAGE 45

▶ **Road Report: At the five-year mark** *p. 60*

Costs Roundup and Outlook

4
3
$
HIGHWAY
2ND
QUARTER

A McGRAW-HILL PUBLICATION

Quality in construction

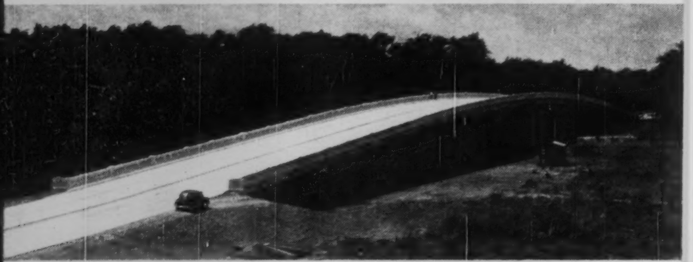
BRIDGES

by Pittsburgh-Des Moines

Woodrow Wilson Memorial Bridge, Alexandria, Va.

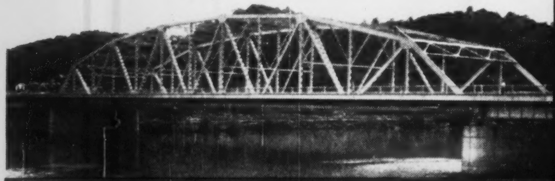
Brick Yard Bridge, Topeka, Kansas

Beaver River Bridge, Rochester, Pa.



Highway Bridge, Jefferson Parish, La.

With 12 steel fabricating plants in Pennsylvania, Alabama, Maryland, Iowa, Wyoming, Utah and California, PDM meets promptly and efficiently the material requirements for highway bridges of every type. Skilled field organizations assure sound craftsmanship in erection, with crews experienced in all phases of bridge construction, including foundations, pile driving and concrete. ● Wherever your project, PDM's nationwide facilities can serve it well. Let us quote!



Fleming Park Bridge, Neville Island, Pa.

Dooker's Hollow Bridge, Allegheny County, Pa.

PDM
STEEL COMPANY

Pittsburgh-Des Moines Steel Company

Plants at PITTSBURGH, WARREN, BRISTOL, PA. • BALTIMORE • BIRMINGHAM
DES MOINES • PROVO, UTAH • CASPER, WYO. • SANTA CLARA, FRESNO,
STOCKTON, CALIF.

Sales Offices:

PITTSBURGH (25)........3414 Neville Island
BALTIMORE (26)..........Curtis Bay Station
NEW YORK (17)..Suite 2716, 200 E. 42d St.
NEWARK (2)................744 Broad St.
CHICAGO (3)..618 First National Bank Bldg.
ATLANTA (5)....361 E. Paces Ferry Rd., N.E.
DES MOINES (8)..........915 Tuttle Street
DENVER (2).....323 Railway Exchange Bldg.
DALLAS (1).....Suite 1719, Southland Center
SEATTLE (1).........Suite 322, 500 Wall St.
SANTA CLARA, CALIF.......621 Alviso Road
EL MONTE, CALIF............P.O. Box 2012
FRESNO, CALIF................346 "G" St.
STOCKTON, CALIF.......348 N. Harrison St.
PROVO, UTAH..............P.O. Box 310

GOODYEAR

BEST BET FOR BIG BIDS

Let Goodyear show you ways to cut your tire costs

Competition for big jobs keeps you on your toes. That's why it pays to do everything possible to protect your profit margin. And much of your success on the big jobs rides on the tires you use.

Your Goodyear Big-Tire Specialist knows what problems you face in terrain, roads, climate, schedules and speeds. And he knows which tire is best for each need and how to keep costs in line. When you call him in for an analysis, you are assured his recommendations on tires will come from the most complete line of the world's toughest earthmover tires.

He's ready with On-The-Job Service whenever you need it. Goodyear Contractor Service means that you can have a tire-maintenance program on-the-job. This service is geared to save man-hours, machine-hours and tire life.

Plus — BIG-TIRE PERFORMANCE
Example: SUPER ROAD LUG

Jounce it over the roughest terrain and the Goodyear Super Road Lug shrugs off flexing, cuts and piercing blows. Reason? This tire embodies new and advanced super-toughening agents that make it super-tough on wear. What's more, rugged 3-T Processed Cord (nylon or rayon) — triple-tempered by Tension, Temperature and Time — give you unequalled tire strength and stamina.

Why not get the full story on the performance and savings that make the Super Road Lug your best bet for big jobs — and details on Goodyear Contractor Service — *before* your next bid. Just call your Goodyear dealer — or write Goodyear, Truck Tire Department, Akron 16, Ohio. Remember, lots of good things come from Goodyear.

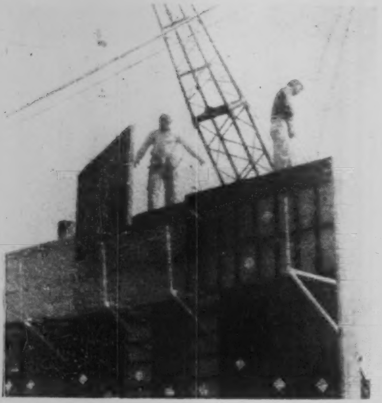
Road Lug — T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

Buy and Specify Truck Tires by

GOODYEAR

MORE TONS ARE HAULED ON GOODYEAR TRUCK TIRES THAN ON ANY OTHER KIND

9 Twin Bridges



Symons Steel-Ply Forms Lick Tight Schedule

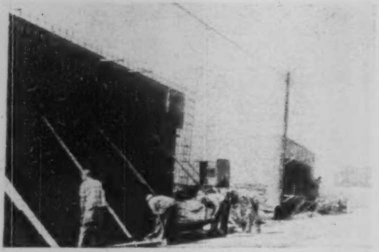
. . . Forms Set Horizontally and Stripped in Sections

Eight months to build the piers and substructure for nine twin highway bridges. Moore Brothers Construction Co., Verona, Virginia had this tight schedule to meet . . . and made it. Figuring concrete formwork correctly was an important factor in meeting the schedule.

The bridges are part of the 28-mile superhighway that connects the new Dulles International Airport at Chantilly, Va., with Washington, D.C.

On this project, the forms were assembled, stripped and moved easily by manpower so that the forms could be reassembled on a second pier while the first was being stripped. Concrete was poured at the rate of about 3 feet an hour with each pier poured in a continuous operation.

The complete *Chantilly story* sent *free* on request. Symons Steel-Ply Forms are rented with purchase option.



Symons Forms are easily moved from completed pier (right) to new pier at left. Symons scaffold brackets aided materially in setting up forms.

Symons

SYMONS CLAMP & MFG. CO.

4265 Diversey Ave., Dept. F-1, Chicago 39, Ill.

Warehouses Thruout the U.S.A.

MORE **SAVINGS** FROM **SYMONS**

ENGINEERING NEWS-RECORD

EIGHTY-SEVENTH YEAR OF PUBLICATION

A McGraw-Hill Publication • 330 West 42nd Street, New York 36, N.Y. • LOngacre 4-3000

Editor, Waldo G. Bowman

Managing Editor, **Arthur J. Fox, Jr.**

Senior Editors, **Frederick S. Merritt, James B. Sullivan, Leo J. Ritter, Jr.**

Transportation—Roads, Bridges, Railways, Airports, Pipelines, Ports
Leo J. Ritter, Jr., Edward M. Young, Jr., Joseph F. Wilkinson

Buildings—Commercial, Industrial, Housing; Codes, Specifications
Frederick S. Merritt, David B. Hill, C. W. Griffin, Jr.
Ronald G. Burns

Water—Sanitation, Water Supply, River Control, Power, Irrigation
James B. Sullivan, William W. Jacobus, Jr., Marie Jensen

Business—Management, Labor, Finance, Markets, Contracts, Economics
Robert J. Stinson, Charles J. Harding

Regional Editors
J. Roland Carr, *Chicago, 645 N. Michigan Ave. (MOhawk 4-5800)*
Martha Alexander, *Staff Assistant*
Lauress L. Wise, *San Francisco, 255 California St. (DOuglas 2-4600)*
Anne Garcia, *Staff Assistant*

Copy—Production
Irwin Landau, Nancy Parkes, John C. Greenough, Robert M. Echols

Presentation
Harry W. Jensen, Robert G. Young

Statistics, Prices, Costs—Business News
Elsie Eaves, *Manager*
Julia Mahoney, *Construction Reports*
Mildred Wetzel, Marian Sciorra, Marie Moravsik
Eleanor Queret, Francine Todisco, Helene Wahlers, Arlene Spielman
James Webber, Ruth Carlson, *Economics*
William P. Larkin, *Prices, Wages, Indexes*
Evelyn Huber, Edith Ostwald, *Statistics*
D. Arlene Ricker, *Unit Prices*

Editorial Research and Indexing
Eva Glerat, Rene Hay, Jane Jacobson

Consulting Editors: **Van Tuyl Boughton, Nathan A. Bowers**

Advertising Sales Manager: **Donald S. Robertson**

Circulation Manager: **Edward F. Bressler**

Washington Bureau, National Press Bldg., Washington 4, D. C., (*REpublic* 7-6630), George B. Bryant, Jr., Chief, Alan Adams, Glen Bayless, Herbert Cheshire, Boyd France, Charles Gardner, Arthur Hermann, Donald Loomis, Daniel McCrary, Gladys Montgomery, Arthur Moore, Burkey Musselman, Seth Payne, Dean Reed, Morton Reichek, Caroline Robertson, David Secrest, Richard Smith, Vincent Smith, Harry Vandernoot.

Domestic News-Bureaus: Atlanta—1375 Peachtree St., B. E. Barnes, Chief, Frances Ridgeway; **Chicago**—645 N. Michigan Ave., Stewart Ramsey, Chief, Bruce Cross, Eric Aiken; **Cleveland**—55 Public Square, Arthur Zimmerman, Chief, Violet Forsha; **Dallas**—2100 Vaughn Bldg., Marvin Reid, Chief, Mary Lorraine Smith, Mae Brown; **Detroit**—856 Penobscot Bldg., Donald MacDonald, Chief, Wesley Perry, Jr., Del Yannatta; **Los Angeles**—1125 W. 6th St., Kemp Anderson, Jr., Chief, Carl Havighorst, Michael Murphy, Marvin Petal, Bill Wallace, Mary Williams, Barbara Lamb; **San Francisco**—255 California St., Jenness Keene, Chief, Donald Winston, Alison Steadman; **Seattle**—6040 Fifth Ave., N.E., Ray Bloomberg.

Foreign News Bureaus: London—John Shinn; **Paris**—Robert Farrell; **Mexico City**—Peter Weaver; **Bonn**—Pete Forbath; **Beirut**—O. M. Marashian; **Tokyo**—Sol Sanders; **Rio de Janeiro**—Leslie Warren; **Caracas**—John Pearson; **Moscow**—Ernest Conine.

Correspondents: In 70 principal U. S. cities and 70 cities throughout the world.
Director of News Bureaus: John Wilhelm; Managing Editor, **Margaret Ralston.**
McGraw-Hill Economics Department: Douglas Greenwald, Manager.

Publisher, Robert F. Boger

MEMBER

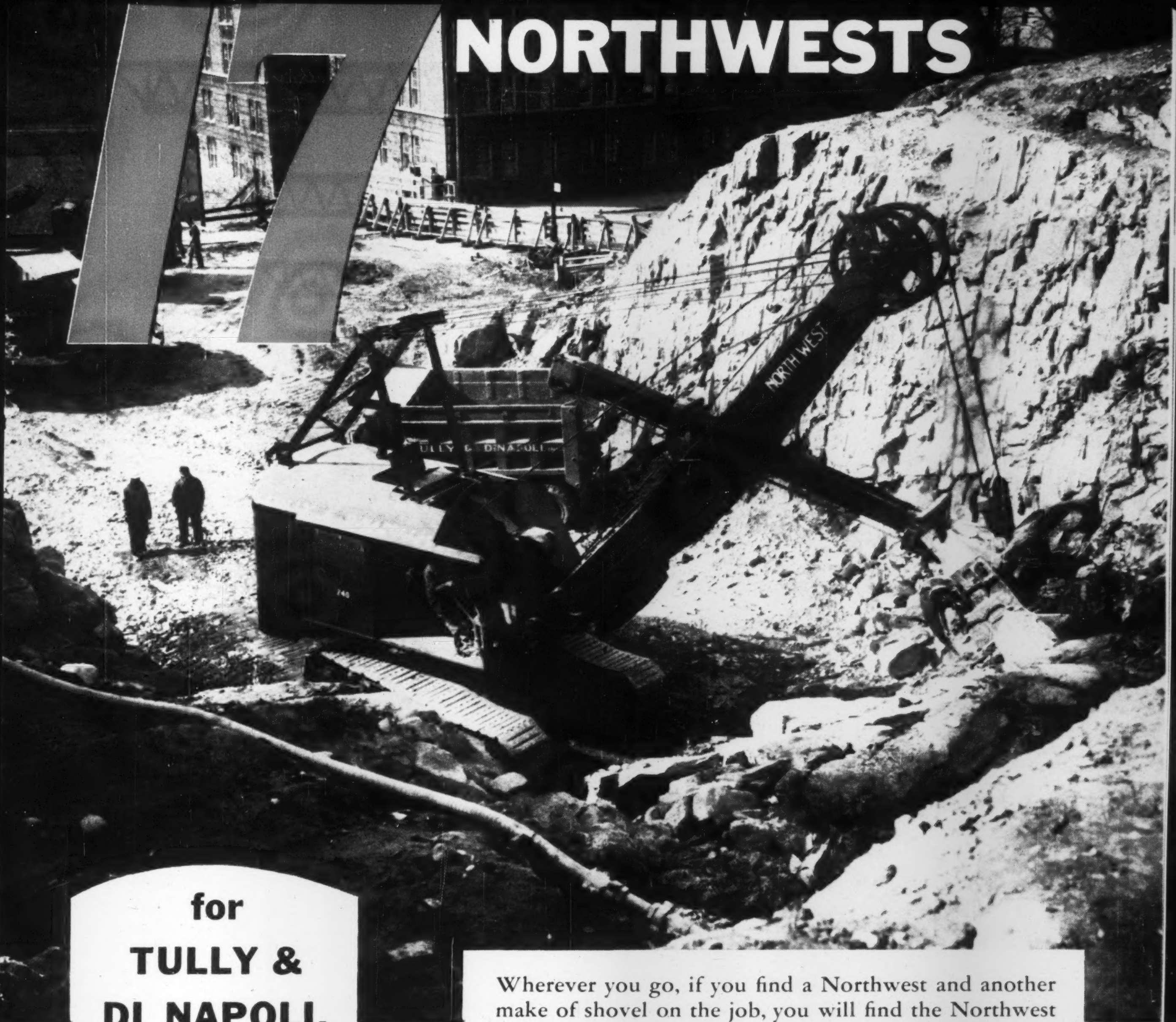
ENGINEERING NEWS-RECORD Vol. 166, No. 25, JUNE 22, 1961

Published weekly by McGraw-Hill Publishing Company, James H. McGraw (1860-1948), Founder. Printed at Albany 1, N. Y. See panel below for directions regarding subscriptions or **change in address. Executive, Editorial, Advertising and Circulation Offices: McGraw-Hill Building, 330 W. 42nd St., New York 36, N. Y.** OFFICERS OF THE PUBLICATIONS DIVISION: Nelson L. Bond, President; Shelton Fisher, Wallace F. Traendly, Senior Vice Presidents; John R. Callaham, Vice President and Editorial Director; Joseph H. Allen, Vice President and Director of Advertising Sales; A. R. Venezian, Vice President and Circulation Coordinator. OFFICERS OF THE CORPORATION: Donald C. McGraw, President; Joseph A. Gerardi, Hugh J. Kelly, Harry L. Waddell, Executive Vice Presidents; L. Keith Goodrich, Vice President and Treasurer; John J. Cooke, Secretary. **Subscriptions are solicited only from persons with identifiable commercial or professional interests in construction and building. Position and company connection must be indicated on subscription orders. Publisher reserves the right to refuse unqualified subscription.** United States subscription rate for individuals in the field of this publication $6.00 per year, single copies 50 cents; foreign $20 per year, payable in advance. Second-Class mail postage paid at Albany, N. Y. Printed in U.S.A. Title registered in U.S. patent office. ©Copyright 1961 by McGraw-Hill Publishing Co., Inc. All Rights Reserved.

UNCONDITIONAL GUARANTEE: Our primary aim is to provide subscribers with a useful and valuable publication. Your comments and suggestions for improvement are encouraged and will be most welcome. The publisher, upon written request, agrees to refund the part of the subscription price applying to the remaining unfilled portion of the subscription—if editorial service is unsatisfactory.

SUBSCRIPTIONS: Send subscription correspondence and change of address to Fulfillment Manager, ENGINEERING NEWS-RECORD, 330 W. 42nd St., New York 36, N. Y. Subscribers should notify, publisher *promptly of any change of address, giving old as well as new address, and including postal zone number,* if any. If possible enclose an address label from a recent issue of the magazine. Please allow one month for change to become effective.

Postmaster: Please send Form 3579 to Fulfillment Manager, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.



17 NORTHWESTS

for
**TULLY &
DI NAPOLI,
INC.
NEW YORK
N. Y.**

Wherever you go, if you find a Northwest and another make of shovel on the job, you will find the Northwest handling the tough digging. There is no better answer to the question as to whether a Northwest will dig *profitably.* Put it in rock or put it in dirt! The power, the speed, the endurance of the unusual Northwest Dual Independent Crowd handle the tough digging faster and make the easy digging easier.

Pictured is the 17th Northwest bought by Tully & Di Napoli, Inc., of New York City . . . another rig in perhaps the country's hardest digging—Manhattan schist! Here, again, is another contractor who has signified his confidence in Northwest equipment with orders—repeat orders based on profitable performance.

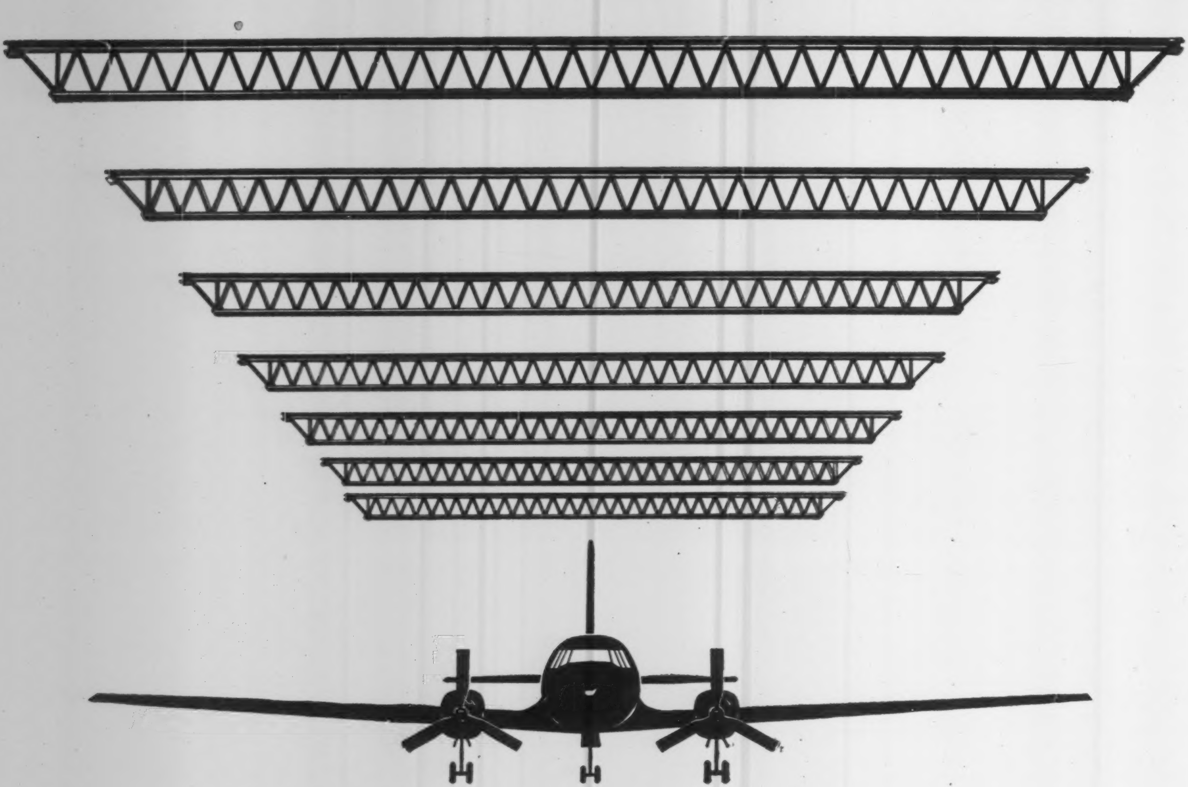
To be able to dig rock, to be sure, is a standard shovel ability. But to dig it profitably is a quality you *have to have.* There is no better proof of this ability than the fact that every 3rd Northwest sold is a repeat order in the hands of a satisfied customer!

NORTHWEST
CRANES • SHOVELS • DRAGLINES
PULLSHOVELS • TRUCK CRANES

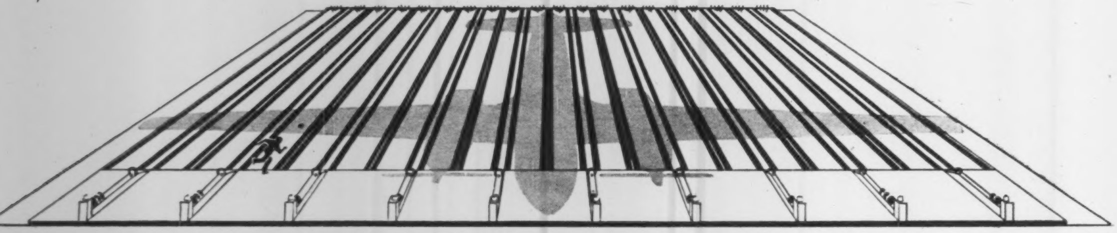
3/4 to 3 Cu. Yd. Capacity

NORTHWEST ENGINEERING COMPANY
1502 Field Bldg. • 135 South La Salle Street • Chicago 3, Illinois

6-80-35-LC



IN AIRCRAFT HANGARS OR BOWLING LANES...



Where maximum open floor space is a must... design and build with Macomber ALLSPANS!

See what you can put under 120-foot ALLSPANS! 20 regulation bowling lanes . . . or a Convair 440 . . . and all with room to spare. Get the many design and erection economies of open-web framing **plus** clear spans up to 120 feet—with ALLSPANS, the **longest, strongest** open web joists you can specify or buy!

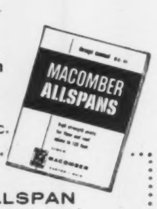
MACOMBER
CANTON 1, OHIO

ALLSPANS • V-LOK • V-PURLINS
BOWSTRING TRUSSES • ROOF DECK • STRUCTURAL STEEL

Find Your Local MACOMBER Representative in the Yellow Pages

SEE OUR CATALOG IN SWEET'S OR WRITE FOR COPY

Complete 28-page construction reference manual
- Dimensions
- Properties
- Load Tables
- Deflections
- Bridging
- Decking, etc.



Please send me your ALLSPAN Design Manual

NAME

COMPANY

POSITION

ADDRESS

CITY ZONE STATE

ENR-617

Don't let anyone kid you:

The laws of chemistry cannot be repealed!

You may hear some talk from the makers of substitute pipes . . . claims that their product is now — somehow — a different product than it was last year — or ten years ago . . . that it is no longer subject to swift, sure chemical destruction by acids and wastes. Don't let anyone kid you. Most substitute pipes are made from chemically active materials. When they are brought into contact with acids, a reaction is bound to occur, because the laws of chemistry cannot be repealed. Vitrified clay pipe, on the other hand, has been specifically designed for use under the severe conditions of sanitary sewers. It has proved itself over and over again. Amvit Jointed Clay Pipe is strong and rigid, can't sag or bend. The plastic joint, like the pipe, is acid resistant. And, roots cannot enter this tight compression joint. Acid-laden, high temperature sewage, discharged from washing machines and garbage disposal units will not bother Amvit Jointed Clay Pipe in any way. Neither will the abrasive action of sand or gravel. For more information on how Amvit can help cut sewer project costs, write or call American Vitrified Products Company, National City Bank Building, Cleveland, Ohio, or our office nearest you.

SINCE 1848

AMERICAN VITRIFIED PRODUCTS COMPANY • CLEVELAND, OHIO

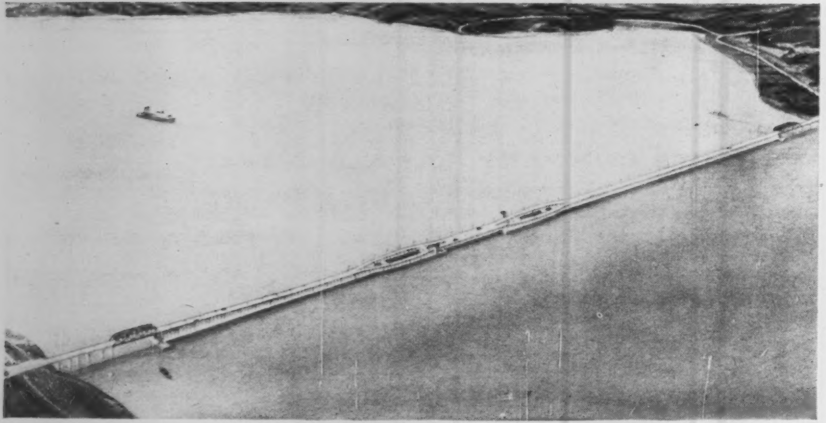
AMERICAN

Plants Across the Nation: Brazil, Indiana • Chicago, Illinois • Cleveland, Ohio • Crawfordsville, Indiana • Detroit, Michigan • East Liverpool, Ohio Grand Ledge, Michigan • Lisbon, Ohio • Los Angeles, California • Milwaukee, Wisconsin • Somerville, New Jersey • South Bend, Indiana • St. Louis, Missouri • Whitehall, Illinois

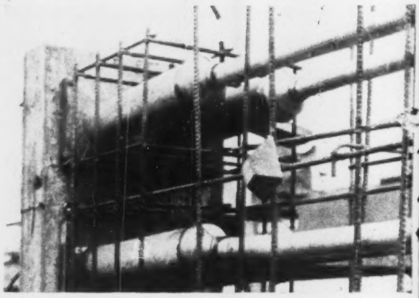
Regional Offices: Cleveland, TO 1-6750 • Chicago, ST 2-5243 • Detroit, GA 1-1940 • Los Angeles, EL 9-4535 • Milwaukee, HO 6-4990 • New York, SP 6-7700 • Somerville, N.J., FO 9-4378 • St. Louis, HA 9-5400

FIRST POST-TENSIONED major highway bridge in Illinois forms a grade separation over the Edens and Northwest Expressway interchange in Chicago. The 30 concrete girders were cast in place and the earth later removed from beneath the spans. Center span is 152 ft. long...two abutment spans, 156 ft. Engineers: Cook County (Ill.) Dept. of Highways. Consulting Engineers: Schupack & Zollman. General Contractor: Thomas McQueen Company.

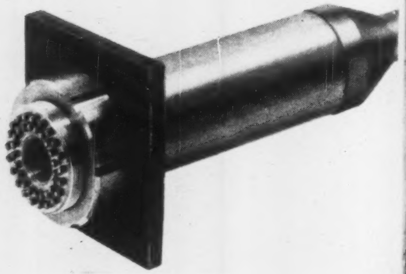
NEW...PRESTRESSED CONCRETE



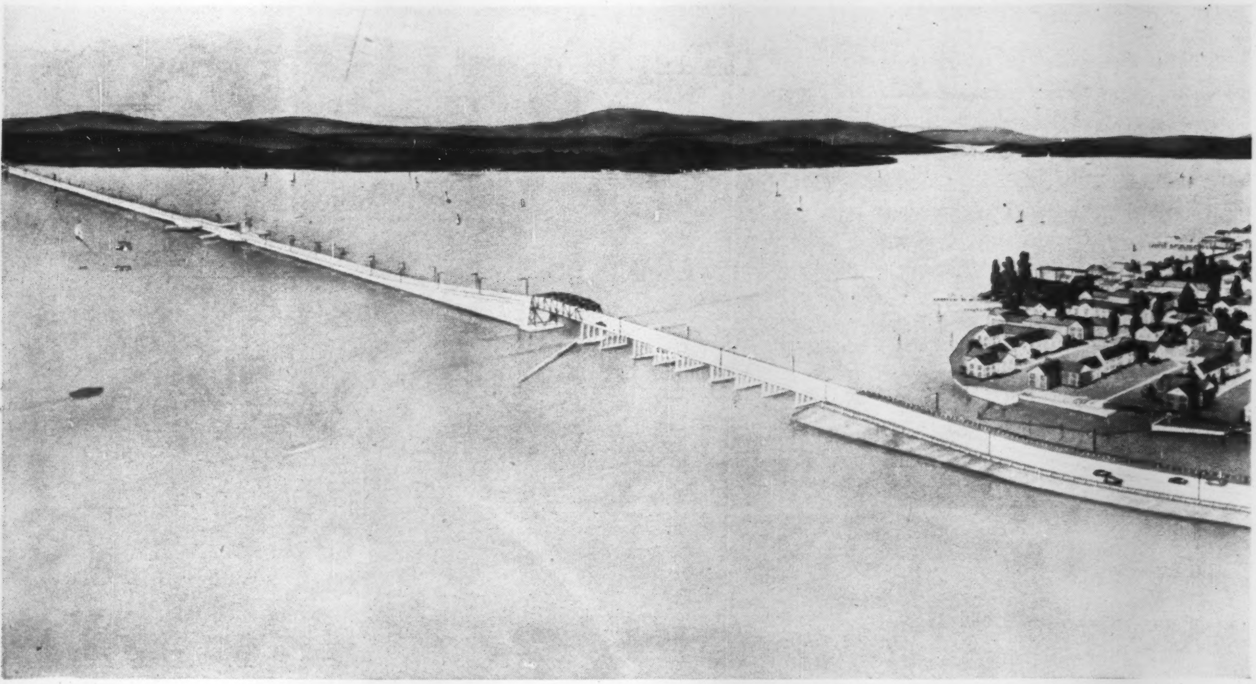
REPAIR AND STRENGTHENING of 1½-mile pontoon bridge across the Hood Canal near Seattle. Each pontoon will be reinforced with twenty-four 40-wire tendons. These will strengthen the pontoons and the joints between them, making the sections of the bridge on either side of the draw span into a continuous prestressed structure. Engineers: State of Washington Toll Bridge Authority. Consulting Engineers: Howard, Needles, Tammen & Bergendoff. General Contractor: Yuba Erectors Division of Yuba Consolidated Industries.



DETAIL OF END ANCHORS of Ryerson tendon assemblies and reinforcing steel at end of typical girder before closing forms.



MOVABLE ANCHOR HEAD of Ryerson BBRV system assembly after stressing. The movable anchor head is positively held in its final position by means of a lock nut screwed against the bearing plate. The center hole, after removal of the pull rod is used as the grout inlet.



SECOND LAKE WASHINGTON FLOATING BRIDGE will link Seattle and Evergreen Point, Wash. It will be made up of 29 units, each post-tensioned by approximately 40 tendons of 14 or 26 wires. Two movable pontoon sections will retract each way from the center to provide a 200-ft. clear opening. Engineers: State of Washington Toll Bridge Authority. General Contractor: Guy F. Atkinson Company.

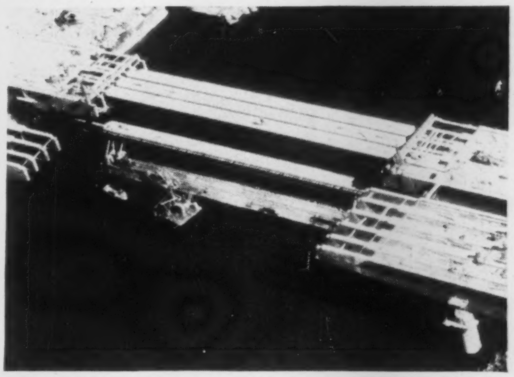
BRIDGES post-tensioned by Ryerson

In concrete structures the spotlight is on prestressing—and there's no more versatile and practical method of prestressing than Ryerson post-tensioning by the BBRV system.

Shown here are only four recent jobs in which Ryerson post-tensioning was used. In addition, everything from lift-slab libraries to parking garages, expressway embankments to airfields, are being built with the help of Ryerson post-tensioning service.

This unique Ryerson service covers prestressed concrete application completely—from adaptation of the engineers' design through the final stages of field erection, including forced development calculations, quality-controlled tendon and anchorage assembly, equipment for precise stressing and positive grouting, job-site technical assistance and dependable deliveries. And the entire service is wrapped up in a complete, single-priced post-tensioning package.

For further information on post-tensioning and other Ryerson products and services for the construction industry, contact your nearby Ryerson plant.



NATION'S LONGEST post-tensioned concrete span is the 320-ft. center span of the Oneida Lake Bridge near Brewerton, N.Y. The post-tensioning "package" included over 1000 tendon and anchorage assemblies—used in twenty-four 146-ft. cantilever girders, each weighing 240 tons...and ten 231-ft. drop-in girders weighing 230 tons apiece. Owner: State of New York, Dept. of Public Works. Engineers: Summers, Munninger & Molke. General Contractor: Terry Contracting, Inc.

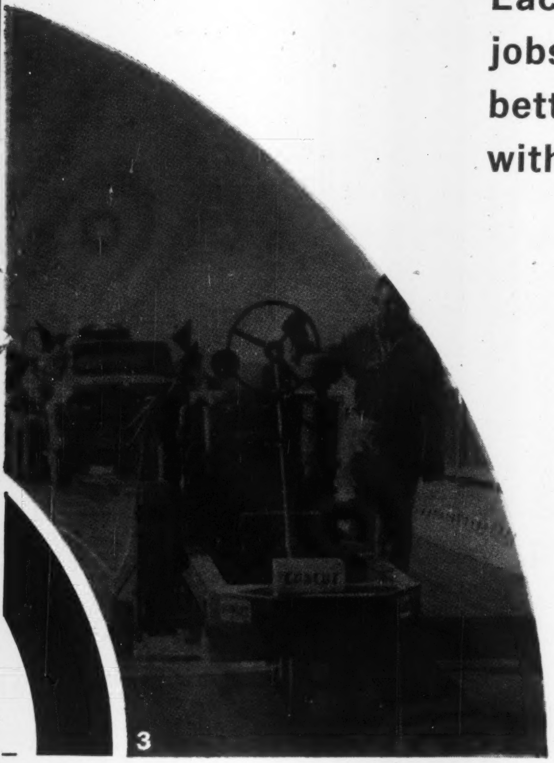
RYERSON

JOSEPH T. RYERSON & SON, INC., MEMBER OF THE INLAND® STEEL FAMILY

Re-Bars and Accessories · Post-Tensioning · Spirals · Open-Web Joists · Wire Mesh · Structural Shapes and Tubing · Safety Plate · Stainless Steel · Aluminum Building Products · PVC Water Stops · Expanded Metal · Grating, etc.

Industrial diamonds cut practically everything . . . especially your production costs

CIRCLE 8 ON READER SERVICE CARD



Each of these jobs is done better and cheaper with diamonds

If you cut or score concrete, cinder block, marble—*any* hard, abrasive material—you can probably use diamonds to advantage. Test them against the method you're using. You'll find out how efficient—and economical—a diamond can be, especially now.

Best grit for metal-bond wheels

A new impact crushing method for natural diamonds (developed by the Diamond Research Laboratory in Johannesburg) is producing the strongest and most durable diamond grit ever obtained for metal-bond wheels. Your tool and wheel manufacturer is ready to help you select the diamond tool that's right for *your* job.

1 **Grooving Concrete Blocks.** *Steel power saw with small natural diamonds cuts precise grooves into face of concrete block at Rocklite Products, Ventura, Calif. Scored single block resembles two blocks, and an interesting effect is obtained at low cost.*

2 **Cutting Joints in Concrete.** *Single machine utilizes saws edged with natural diamonds to cut transverse and longitudinal joints in hardened concrete highways and air-strips. Saw cuts through aggregate, but will not displace it, as some methods will with vibrators.*

3 **Removing Bumps** *from concrete runways and highways. Operated by one man, this machine, made by Concut Sales, Inc., El Monte, Calif., smooths hardened concrete with a series of natural diamond wheels.*

4 **Cutting Holes in Masonry.** *Lightweight, portable drilling rig, by Wheel Trueing Tool Co., Detroit, can be hoisted to any position. Small diamonds form cutting edge. This wall is being opened for new piping.*

Industrial Distributors (Sales), Ltd.

ACCURATE, LIGHTWEIGHT, RUGGED...the perfect combination for efficient, convenient engineering work on roads, bridges, construction and tunnels. IMPORTANT FEATURES include 24 or 28 power telescope, internal focusing, coincidence-reading tubular level, and telescope rotatable around its longitudinal axis for rapid checking of level adjustments.

WILD N-2 ENGINEER'S LEVEL
One of a *complete* line of superb instruments for Surveying, Photogrammetry and Microscopy. *Write for Booklet N-2.*

WILD
HEERBRUGG

WILD HEERBRUGG INSTRUMENTS, INC. • PORT WASHINGTON, NEW YORK
In Canada: Wild of Canada Ltd., 157 Maclaren St., Ottawa, Ontario

Reader Comment

CEs for Surveying?

SIR—I do not think that the ASCE proposal requiring land surveyors to become qualified civil engineers is a satisfactory solution to the problem (ENR Apr. 27, p. 102). Much land surveying work is for the purpose of settling boundary disputes, etc., highly specialized technical work lacking in appeal to the broadly trained civil engineer. Educators will not be pleased with the prospect of having to include additional surveying instruction in the curriculum.

Yet unless something is done, surveyors without broad civil engineering training will continue to file subdivision plans that have hundreds of built-in engineering mistakes. To draw a line between surveying and engineering on the basis of "when engineering judgment is required" is obviously impossible from the legal viewpoint. Perhaps it can be done this way: If public access is required, the plan must bear the seal of a registered civil engineer. Certainly any development to be occupied or used by large numbers of people would have to have public access for travel and utilities, and the competent engineer would be cognizant of the problems implicit in the planning. If the surveyor wished to do this work in addition to his boundary, topography, and mapping work, he would have to become qualified.

C. J. POSEY
Chairman
Iowa State Board of Engineering Examiners
Des Moines, Iowa

SIR—Your editorial Surveying is Engineering is commendable in that it publicizes the professional aspect of surveying. As an individual, however, I feel very strongly that the picture presented—not only by your editorial but by the Final Report on the Status of Surveying and Mapping by the task committee appointed by the American Society of Civil Engineers—reaches a conclusion that the minority of practicing land surveyors would support.

In the report, under the heading "Re Land Surveying", the conclusions reached are those of the civil engineering profession, not land surveyors who are not civil engineers. To me this does

(*Reader Comment continued p. 22*)

Engineering News-Record welcomes expression of opinions from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance. Letters should be addressed Editor, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

Safer, Brighter, Easier to Service with Swivel Head and Double-Beam Warning

DIETZ

NEW Visi-Flash®

Barricade Flashers

Offering the last word in a flasher optical system . . . one that concentrates more light on the danger or obstacle, re-inforcing the flashing light with a brilliant fringe of reflected light from the headlamps of oncoming traffic.

Flashers that are easier to service, that require less servicing per hour of use, and that will turn on and off as daylight fades or dawns.

No mechanical switches or other moving parts to consume current or cause trouble. Wide choice of low-drain transistorized circuits offer an extensive range of flash rates. Drain on batteries is so slight that even the two-cell No. 665 model will burn about 1500 hours, while the six-cell No. 675 will burn about 4500 hours.

DIETZ Visi-flash
TRANSISTORIZED WARNING LIGHT
PRODUCT NO.
SERIAL NO.
DIETZ Visi-flash

No. 665

No. 675

10 IMPORTANT FEATURES

- Big 7¼″ lens, especially for flasher use
- Optional ½″ reflector rim offers full 10 sq. in. of reflecting surface
- High-brightness neon lamp or standard filament
- Can be rotated 180° to cover any approach angle
- Choice of flash rates and candlepower
- Optional photocell to turn light on, off
- Diecast visor deflects snow, rain, sun and streetlights
- Attached to barricade by tamper-proof bolt
- Single screw, always fastened to head, affords easy servicing of lenses and bulb
- Rugged 18-gauge steel body

Also available in Canada

GO DIETZ® and you go SAFELY!

MAIL THE COUPON NOW — GET ALL THE FACTS

R. E. DIETZ COMPANY, Dept. 56
225 Wilkinson St.,
Syracuse 1, N. Y.

Please send complete information on your improved Visi-Flash Warning Signals, Nos. 665 and 675.

NAME ______ TITLE ______

COMPANY ______

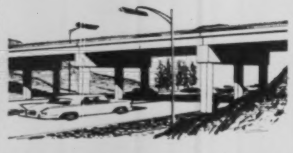
STREET ______

CITY ______ ZONE ______ STATE ______

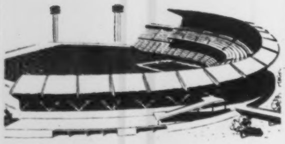
PRESTRESSED CONCRETE

delivers important advantages to a wide variety of structures

Office Buildings



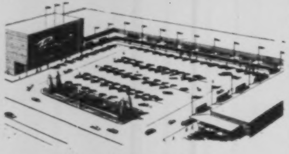
Overpasses



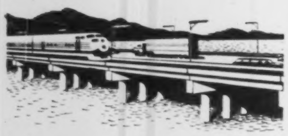
Stadiums

Parking Structures

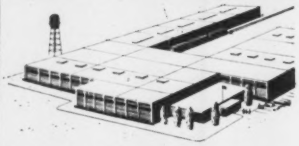
Schools



Shopping Centers

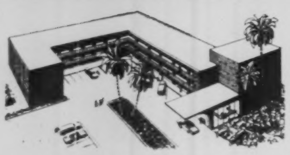


Bridges — Rail and Highway



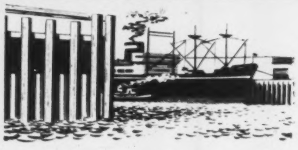
Industrial Plants and Warehouses

Churches



Apartments and Motels

Public Buildings



Marine Structures

In every section of the country architects and engineers are finding, in precast prestressed concrete units, a *flexible, easy to use* construction method for *nearly all types of structures.* Plant-manufactured precast prestressed concrete girders, beams, columns, wall panels, floor and roof units and piling meet *fast construction schedules*—provide *superior structures for less money.*

PRESTRESSED CONCRETE

combines two basic materials to give you the best of both

For plant-produced, quality controlled prestressed concrete, consult the PCI Active Member nearest you:

ARIZONA Arizona Prestressed Concrete Co., Phoenix • United Materials Inc., Phoenix

CALIFORNIA Basalt Rock Co., Napa • Ben C. Gerwick, Inc., San Francisco • Concrete Conduit Company, Div. American Marietta Company, Colton • Delta Prestressed Concrete, Inc., Florin • Rockwin Prestressed Concrete, Santa Fe Springs • San Diego Prestressed Concrete, San Diego • Wailes Precast Concrete Corp., Sun Valley • Griffith Company, Los Angeles

COLORADO Bullen Concrete Products, Pueblo • Prestressed Concrete of Colorado, Denver • Rocky Mountain Prestress, Englewood

CONNECTICUT C. W. Blakeslee & Sons, New Haven

FLORIDA Capitol Prestress Co., Jacksonville • Concrete Structures, Inc., North Miami • Dura Stress, Inc., Leesburg • Duval Engineering & Contracting Co., Jacksonville • Florida Prestressed Concrete Co., Inc., Tampa • Juno Prestressors, Inc., West Palm Beach • Lewis Manufacturing Co., Inc., Miami • Maule Industries, Inc., Miami • Meekins Bamman Precast Corp., Hallandale • Prestressed Concrete, Inc., Lakeland • Southern Prestressed Concrete, Pensacola • West Coast Shell Corp., Sarasota • R. H. Wright, Inc., Fort Lauderdale

GEORGIA American Marietta Company, College Park • Leap Structural Concrete, Inc., Powder Springs • Macon Prestressed Concrete Co., Macon

HAWAII Concrete Engineering Co., Honolulu

IDAHO Gemstone Prestress Co., Idaho Falls • Idaho Concrete Pipe Co., Nampa • Ready to Pour Concrete Co., Idaho Falls

ILLINOIS American Marietta Company, La Grange • American Prestcrete Corp., Plano • Consumers, Div. Vulcan Materials Co., Chicago • Crest Concrete Systems, Lemont • Material Service, Chicago • Midwest Prestressed Concrete Co., Springfield • Precast Building Sections, Chicago • Prestressed Concrete Structures, Frankfort

INDIANA American Marietta Company, Lafayette • Shute Concrete Products, Richmond

IOWA A & M Prestress, Clear Lake • Midwest Concrete Industries, West Des Moines • Prestressed Concrete of Iowa, Iowa Falls • C. W. Shirey Co., Waterloo

KANSAS Russell Ralph Co., Topeka • Sunflower Prestress, Inc., Salina • United Prestress Co., Wichita

LOUISIANA Prestressed Concrete Products Co., Inc., Mandeville • Mid State Prestressed Concrete, Inc., Alexandria

MARYLAND Baltimore Concrete Plank Corp., Baltimore

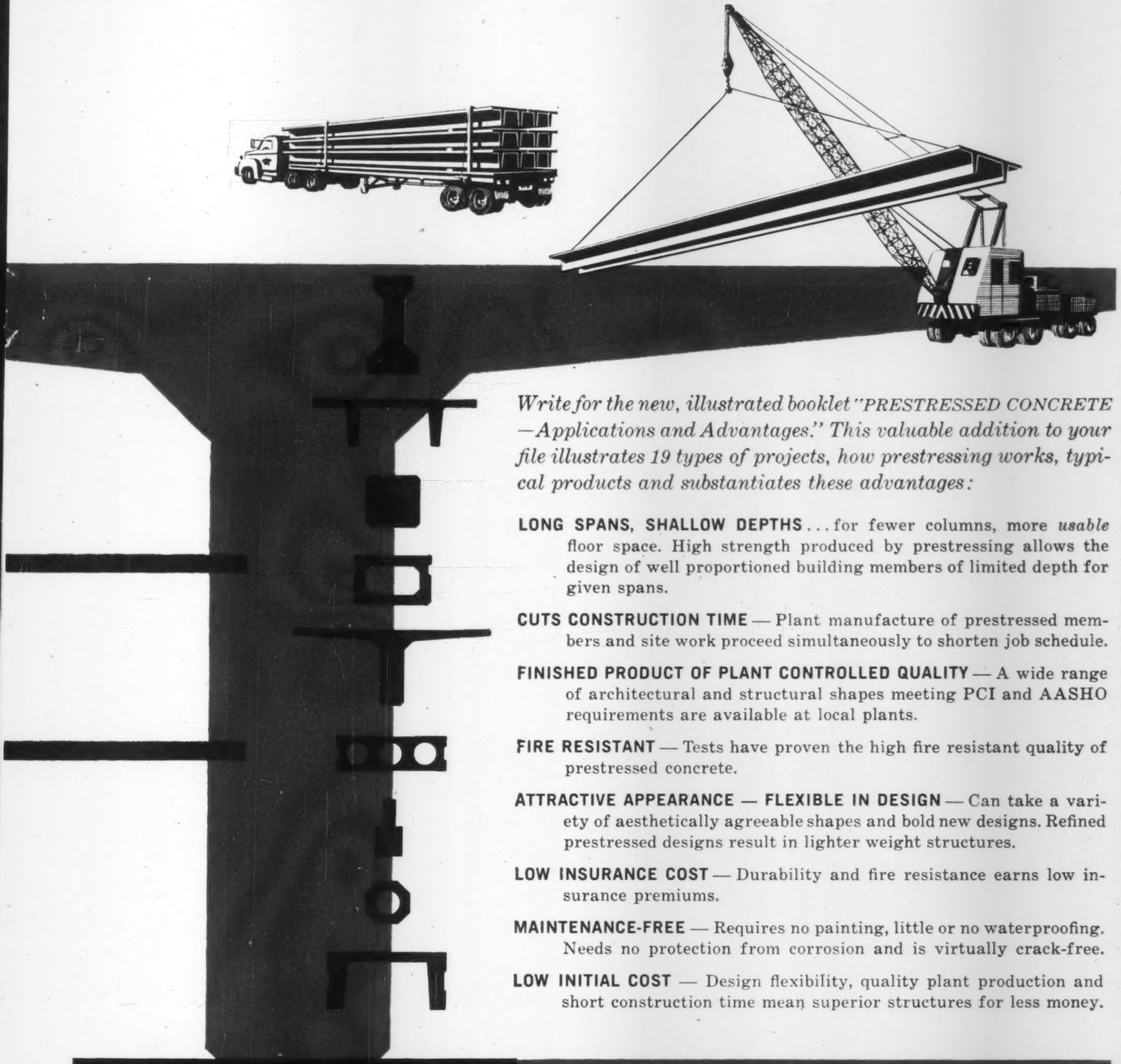
MASSACHUSETTS New England Concrete Pipe Corp., Newton Upper Falls • Northeast Concrete Products, Inc., Plainville • San Vel Concrete Corp., Littleton

MICHIGAN American Prestressed Concrete Inc., Centerline • Lamar Pipe and Tile Company, Div. American Marietta Company, Grand Rapids • Precast Industries, Inc., Kalamazoo • Price Brothers, Livonia • Superior Products Co., Detroit

MINNESOTA Cretex Companies, Elk River • Prestressed Concrete Inc., St. Paul • Wells Concrete Products Co., Wells

MISSISSIPPI F S Prestress, Inc., Hattiesburg • Grenada Concrete Products Co., Grenada • Jackson Ready Mix Corp., Jackson

CIRCLE 12 ON READER SERVICE CARD



Write for the new, illustrated booklet "PRESTRESSED CONCRETE—Applications and Advantages." This valuable addition to your file illustrates 19 types of projects, how prestressing works, typical products and substantiates these advantages:

LONG SPANS, SHALLOW DEPTHS... for fewer columns, more *usable* floor space. High strength produced by prestressing allows the design of well proportioned building members of limited depth for given spans.

CUTS CONSTRUCTION TIME — Plant manufacture of prestressed members and site work proceed simultaneously to shorten job schedule.

FINISHED PRODUCT OF PLANT CONTROLLED QUALITY — A wide range of architectural and structural shapes meeting PCI and AASHO requirements are available at local plants.

FIRE RESISTANT — Tests have proven the high fire resistant quality of prestressed concrete.

ATTRACTIVE APPEARANCE — FLEXIBLE IN DESIGN — Can take a variety of aesthetically agreeable shapes and bold new designs. Refined prestressed designs result in lighter weight structures.

LOW INSURANCE COST — Durability and fire resistance earns low insurance premiums.

MAINTENANCE-FREE — Requires no painting, little or no waterproofing. Needs no protection from corrosion and is virtually crack-free.

LOW INITIAL COST — Design flexibility, quality plant production and short construction time mean superior structures for less money.

PRESTRESSED CONCRETE INSTITUTE

PRESTRESSED CONCRETE INSTITUTE
205 WEST WACKER DRIVE • CHICAGO 6, ILLINOIS

Gentlemen: Please send me your free booklet "Prestressed Concrete—Applications and Advantages."

NAME____________________
N5-18
POSITION____________________
FIRM____________________
ADDRESS____________________
CITY________________ ZONE______ STATE____________

MISSOURI Carter-Waters Corp., Kansas City • Missouri Pres-Crete, Inc., Overland • Dexter Ready Mix Concrete Co., Dexter

MONTANA Floyd Pappin & Son, Inc., Great Falls

NEBRASKA Nebraska Prestressed Concrete Co., Lincoln • Wilson Concrete Co., Omaha

NEW JERSEY Cameo Concrete Corp., Vineland • Formigli Corp., Berlin

NEW MEXICO American Marietta Company, Albuquerque

NEW YORK American-Marietta Company, New York City • American-Marietta Company, Syracuse • Precrete, Inc., Corona • Principe-Danna, Inc., Long Island City • Raymond International, Inc., New York • Winkrete Precast Co., Inc., Syracuse

NORTH CAROLINA Arnold Stone Co., Greensboro • Concrete Materials, Inc., Charlotte • North Carolina Products Corp., Raleigh • Piedmont Construction Co., Winston-Salem • S & G Prestress Co., Wilmington

OHIO American Marietta Company, Columbus • Concrete Masonry Corp., Elyria • Concrete Pipe Co. of Ohio, Cleveland • Marietta Concrete, Div. American-Marietta Company, Marietta

OKLAHOMA Oakley Engineering Co., Tulsa

OREGON Builders Supply Co., Medford • Empire Pre-Stress Concrete of Oregon, Portland • Ross Island Sand & Gravel, Portland

PENNSYLVANIA American-Marietta Company, Norristown • Dickerson Structural Concrete Corp., Youngwood • Eastern Prestressed Concrete Corp., Line Lexington • New Enterprise Stone & Lime Co., Inc., New Enterprise • Pennsylvania Prestress, Inc., York • Schuylkill Products, Inc., Cressona • Turbotville Block Co., Turbotville

SOUTH CAROLINA American Marietta Company, Columbia • Ballard Rice Prestressed Corp., Greenville

SOUTH DAKOTA Gage Bros. Concrete Products, Sioux Falls

TENNESSEE American Marietta Company, Memphis • Concrete Prestressed Corp., Bristol • Knox Concrete Products, Inc., Knoxville • Nashville Breeko Block Co., Nashville

TEXAS Anchor Wate Co., Almeda • Atlas Structural Concrete, El Paso • Crowe Gulde Prestressed Concrete Co., Amarillo • Span, Inc., Dallas • Texas Concrete Co., Victoria • National Precast Corp., Houston • Texas Quarries, Inc., Austin

UTAH Utah Prestressed Concrete Co., Salt Lake City

VIRGINIA Concrete Structures, Inc., Richmond • Shokey Bros., Inc., Winchester • Southern Block & Pipe Corp., Norfolk • Virginia Prestressed Concrete Corp., Roanoke • Alexandria Prestressed, Inc., Alexandria

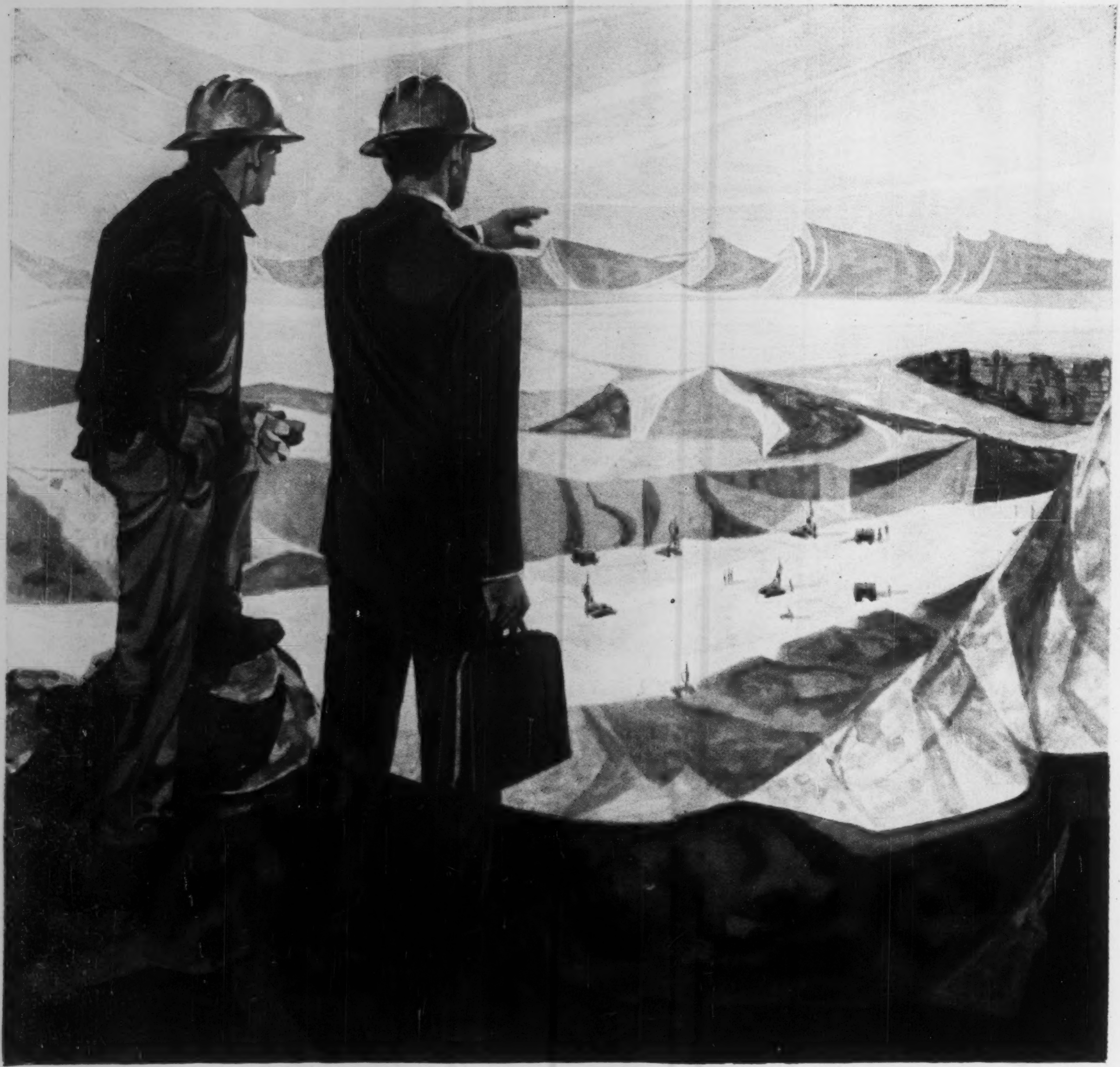
WASHINGTON Associated Sand & Gravel Co., Everett • Central Pre-Mix Concrete Co., Spokane • Concrete Technology Corp., Tacoma

WISCONSIN Concrete Research, Inc., Waukesha • Prestressed Concrete Products Corp., Verona • West Allis Concrete Products Co., Milwaukee • Eau Claire Stresscrete, Inc., Eau Claire • F. Hurlbut Co., Green Bay

PUERTO RICO Pacadar Prestressed Beams Corp., San Juan

CANADA **Alberta**: Con-Force Products Ltd., Calgary • **Manitoba**: Building Products & Coal Co., Ltd., Winnipeg • Supercrete Ltd., St. Boniface • **New Brunswick**: Joseph A. Likely Ltd., St. John • **Newfoundland**: Lundrigan's Concrete Ltd., Corner Brook • **Nova Scotia**: L. E. Shaw Ltd., Halifax • **Ontario**: Murray Associates Ltd., Toronto • Pre-Con Ltd., Brampton • Ryan Builders Supplies Ltd., Windsor • Schell Industries Ltd., Woodstock • Standard Prestressed Structures Ltd., Maple • Toronto Cast Stone Co. Ltd., Toronto • Wilson Concrete Products Ltd., Belleville • J. M. Wright Ltd., North Bay • **Quebec**: Pressure Pipe Ltd., Montreal

This advertisement sponsored by PCI Active Members



Through the present he sees the future . . .

Intent, this Gardner-Denver Construction Specialist watches Gardner-Denver equipment at work on a customer's job. Yet, even as he watches, his mind races ahead to the future—exploring new ways to do the work even better, more quickly, at lower cost.

Gardner-Denver improvements and innovations begin in the field. Here consultation with users, and careful, informed observation, pay off in better designed, better quality products that give the buyer more for his money.

"Equipment today for the challenge of tomorrow" is no idle phrase with Gardner-Denver. It is founded on facts that you can easily test for yourself by calling your nearest Gardner-Denver distributor or field office.

GARDNER-DENVER Since 1859

EQUIPMENT TODAY FOR THE CHALLENGE OF TOMORROW

GARDNER - DENVER

Gardner-Denver Company, Quincy, Illinois
In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Avenue, Toronto 16, Ontario

ENGINEERS: RAYMOND offers soil information for site of 1964 World's Fair

As plans take definite shape for the 1964-65 World's Fair at Flushing Meadows, Long Island, the engineering question arises—what's the ground like for foundations?

Raymond knows. Borings, soil tests, and pile tests for the 1939 World's Fair, on the same site, were made by Raymond under Contract #1. We have data on this area in our files, available on request to architects and engineers concerned with new construction for the forthcoming Fair. What you need we may be able to offer on a moment's notice. Just incidentally, the only permanent buildings of the 1939 Fair stand firmly today on Raymond foundations. 1,817 piles were driven for the Amphitheater & Island Stadium and 719 for the New York Exhibition building.

From the ground down—here and overseas

The World's Fair is only one example. In a great many areas of the States—and elsewhere throughout the Free World—chances are that Raymond has already made soil investigations. The experience of 64 years is readily at hand. So, with us, you will be that much ahead, which is a large step indeed.

But soil tests are only the prelude. We are equipped, too, to drive foundations for any type of project, anywhere in the country, and to provide complete construction services abroad. Whatever and wherever your construction plans may be, give us a call. We'll be pleased to consult with you.

CONCRETE PILE DIVISION
RAYMOND
INTERNATIONAL INC.

140 CEDAR STREET, NEW YORK 6, N. Y.

Branch Offices in principal cities of the United States. Subsidiaries in Canada, Central and South America and other countries around the world.

FOUNDATIONS AND SPECIALIZED CONSTRUCTION IN AMERICA . . . COMPLETE CONSTRUCTION SERVICES ABROAD

CIRCLE 15 ON READER SERVICE CARD

GET REAL PRODUCTIVITY

Doubled work capacity since they switched to GM Diesel Power

Is there a difference in Diesels? Ask Wilmer Lean, Patrol Superintendent of Wisconsin's Walworth County Highway Department, that question and you'll get a big "Yes!"

And Mr. Lean has on-the-job proof to back up his opinion.

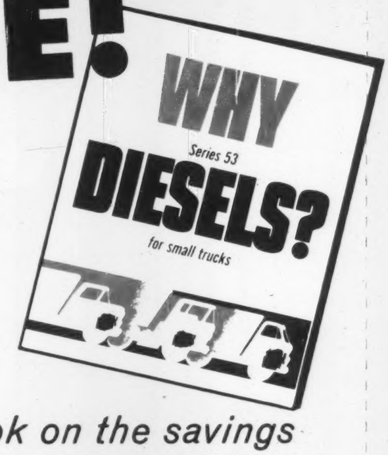
For he pulled a competitive Diesel out of an Austin-Western 99H grader last year, replaced it with a "4-71" GM Diesel. Result? "The '4-71' has doubled the work capacity of this unit," Mr. Lean says. Adds, "We now have four graders powered by GM Diesels in use and we're adding another 'Jimmy' by repowering an Oshkosh utility truck."

It's easy to see why a GM Diesel-powered grader will 'doze, cast, plane and crown faster than a grader powered by any other Diesel. A "Jimmy" delivers power on every piston downstroke—accelerates faster to pick up the load "right now." This means you get more work done in less time—or the same amount of work done with fewer pieces of equipment. Either way you save big money in capital investment and operating expenses.

Want to know more? Your GM Diesel Distributor has the answers. He's part of a coast-to-coast network of "engine people" you'll find in the Yellow Pages under "Engines, Diesel." Or send the post card for more information.

GM DIESEL ALL-PURPOSE

FREE!



20-Page book on the savings you'll make by "GOING DIESEL"

Tells you

- How You Save
- Why You Save
- Where You Save

Tells you how to figure

- Fuel & Maintenance Savings
- Yearly Return on Investment

Plus Many Other Valuable Tips

First Class
Permit 10,688
PAID
Section 34.9
PL & R,
Detroit, Mich.

BUSINESS REPLY CARD

5¢ POSTAGE WILL BE PAID BY

DETROIT DIESEL
13400 West Outer Drive
Detroit 28, Michigan

Dept. ENR-6

Please send me my copy of "Why Series 53 Diesels for Small Trucks?"

NAME.. (Please print)

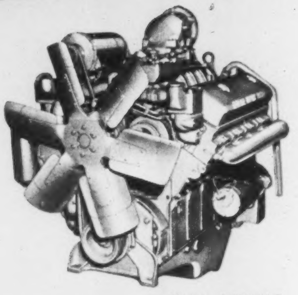
COMPANY..

ADDRESS..

CITY.................... COUNTY.................... STATE....................

WHY
Series 53
DIESELS?
for small trucks

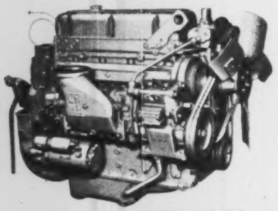
MAIL THIS CARD TODAY!



V-71 Truck Models

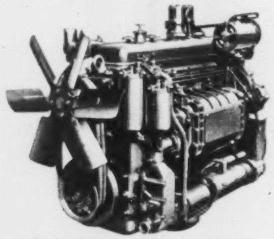
6V-71 . . . 218 H.P.
8V-71 . . . 290 H.P.
12V-71 . . . 434 H.P.

Series 53 and 71 Truck Models



Series 53 Truck Models

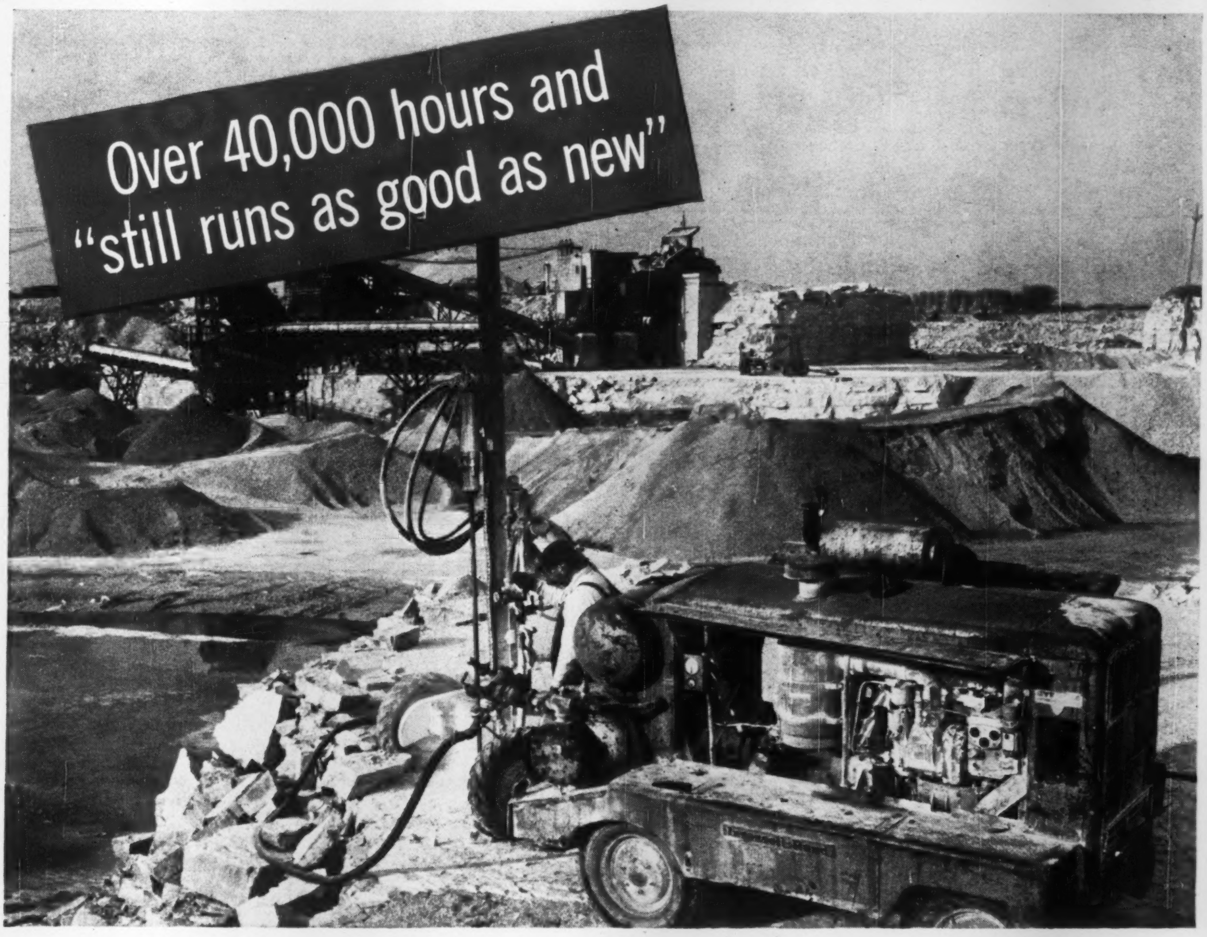
3-53 . . . 97 H.P.
4-53 . . . 130 H.P.
6V-53 . . . 185 H.P.



Series 71 In-Line Truck Models

4-71E . . . 145 H.P.
6-71E . . . 218 H.P.

GET A GM DIESEL ENGINE



One look will tell you that this Ingersoll-Rand 315 Gyro-Flo compressor has had to work for a living.

And worked it has!

For over 9 years it has been on the job day in, day out, supplying air for drills and hammers in the Halquist Lannon Stone Company quarry near Sussex, Wisconsin.

In those nine years this GM Diesel powered unit has racked up over 40,000 hours—*been overhauled only twice* at approximately 18,000-hour intervals.

Mr. A. C. Halquist says, "The GM Diesel 3-71 in this compressor has had only minor adjustments in addition to two overhauls and still runs as good as new. It's one of the best pieces of equipment we ever bought."

If that's the kind of profit-making productivity you want from your equipment, specify a GM Diesel engine when you buy or repower. There's a model of the proper size and output for nearly every type of construction equipment.

For details see your GM Diesel Distributor, or mail the post card.

POWER LINE

Sets the standard of Diesel productivity

GM DIESEL

DETROIT DIESEL ENGINE DIVISION,
GENERAL MOTORS, DETROIT 28, MICH.

In Canada: GENERAL MOTORS DIESEL LIMITED, London, Ontario
Parts and Service Worldwide

Modern Chemistry teams up with Engineering to give you

NERVASTRAL WATERSTOP & WELDBAR*

*PATENT PENDING

The most Impervious, Foolproof, Easy-to-apply Waterstop System ever developed

Just as a chain is no stronger than its weakest link, no waterstop can be better than at the points where it has been spliced. Original planning and research has now made it sure and easy to have durable water-tightness at the spliced waterstop joints.

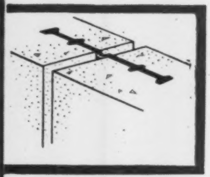
Nervastral Weldbar eliminates the necessity of meticulous matching of non-uniform cross sections of waterstop. It also makes possible the formation of T joints, L joints or butt splicing. There is no need for clamping, forming or chemical curing. Nervastral Weldbar (as shown below) can be easily softened by heat to allow the ends of Nervastral Waterstop to be pressed into it. The Weldbar sets by cooling within a few seconds, and becomes an integral part of the Nervastral Waterstop.

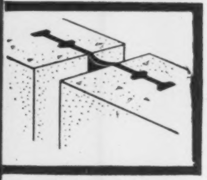
Nervastral Waterstop and Nervastral Weldbar are formulated from a compound based on polyvinyl chloride. This material is completely resistant to Portland cement solids, acids, alkalies, water, mildew, fungi and oxidation. It does not bleed at high temperatures and never cracks when the temperature is low.

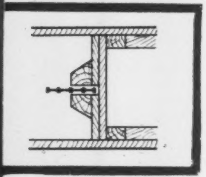
The longitudinal ribs on Nervastral Waterstops are engineered to assure complete integration with concrete so that they are always firmly anchored and expand and contract with the concrete, never allowing a drop of water to come through or around them.

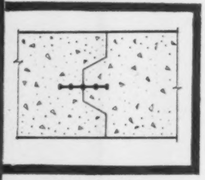
The most important physical characteristics of Nervastral Waterstop and Nervastral Weldbar are great tensile strength, excellent shear resistance and a high degree of resilience and recovery.

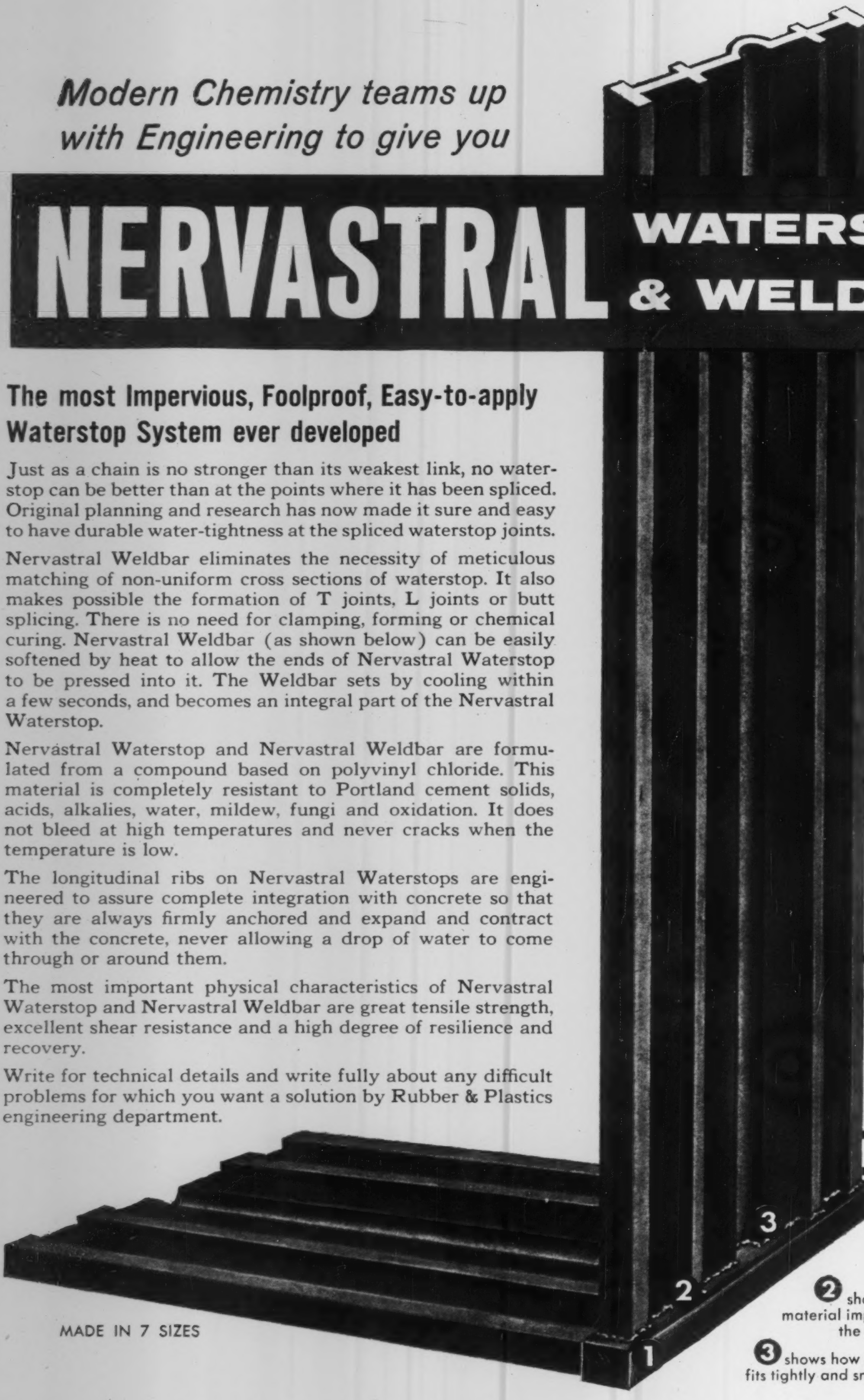
Write for technical details and write fully about any difficult problems for which you want a solution by Rubber & Plastics engineering department.


CONTRACTED


EXPANDED


PLACED IN FORM


INSTALLED



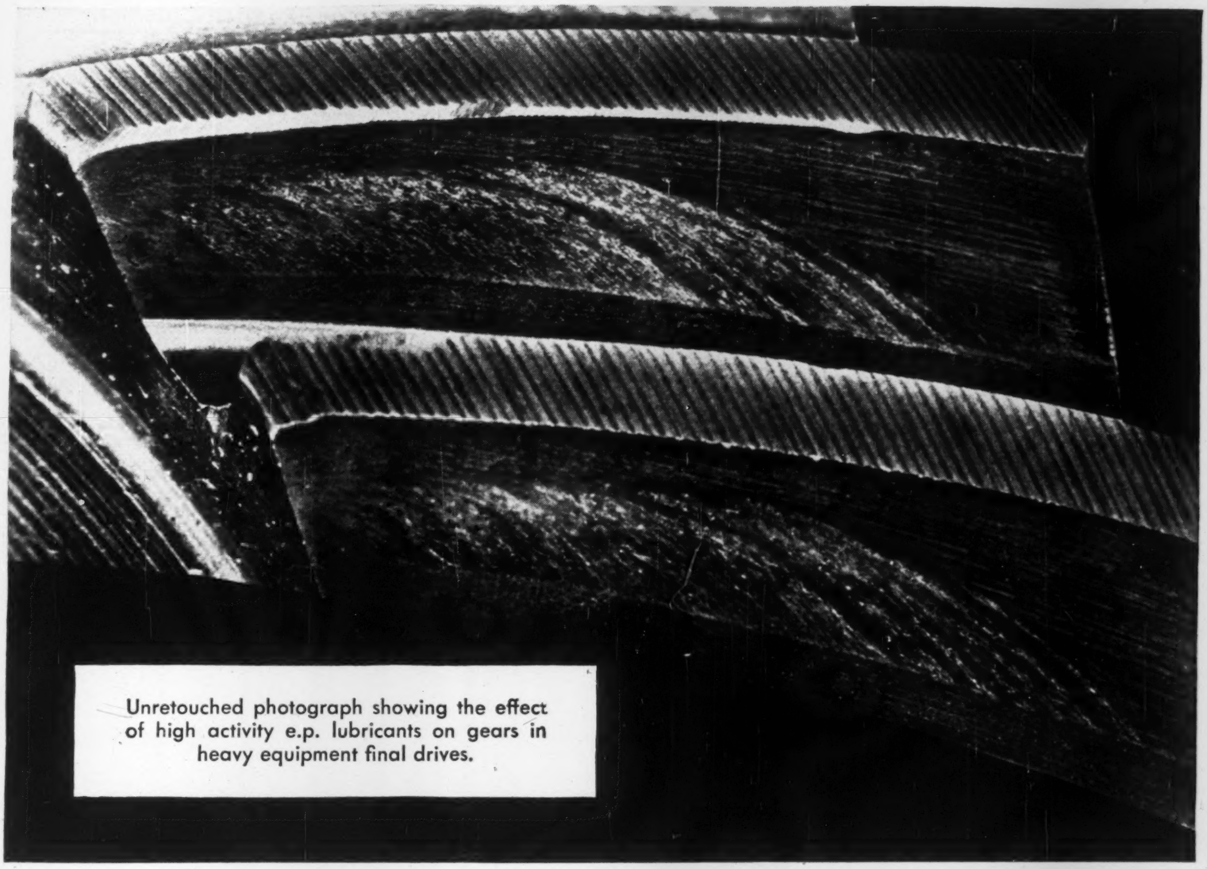
MADE IN 7 SIZES

① is the Weldbar

② shows the head of fluxed material impinged up and around the sides of the Waterstop

③ shows how every contour or curve fits tightly and snugly into the Weldbar

RUBBER & PLASTICS COMPOUND CO., Inc. Time & Life Bldg. • Rockefeller Center • New York 20



Unretouched photograph showing the effect of high activity e.p. lubricants on gears in heavy equipment final drives.

This could happen to your gears

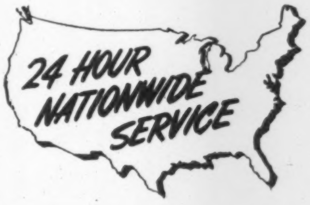
Extreme pressure additives are used in gear lubes to give the oil the film strength needed to prevent scoring and scuffing of gear teeth. There are two kinds of extreme pressure additives on the market today.

High activity extreme pressure additives begin to break down and become corrosive around 250° F. — temperatures often found in heavy-duty equipment. When this happens the lubricant can easily damage, rather than protect the gears. These high activity additives are not suitable for use in heavy-duty equipment.

Low activity extreme pressure additives remain stable at high torque operation through 300° F., coating gears to cushion and prevent any metal to metal contact, offering protection even in extreme conditions.

D-A Universal Gear Lube *never* contains high activity additives. Only the stable, protective *low activity* additives are used. To you this means:

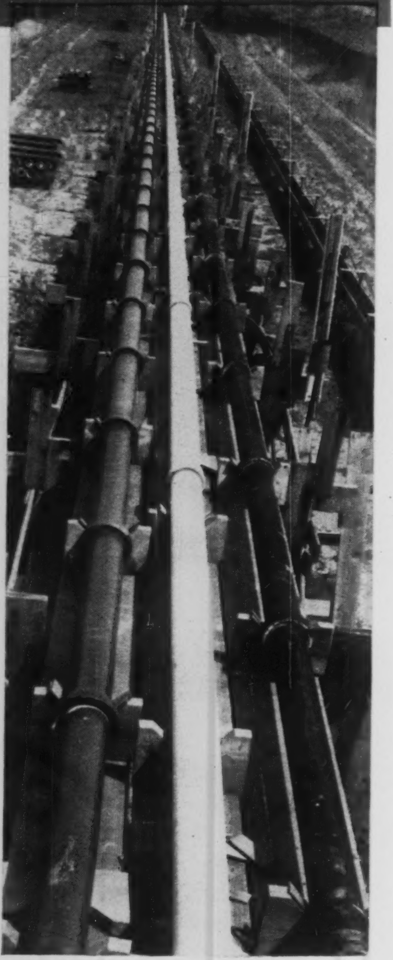
- **no breakdown, no oxidation, no sludge, no corrosion**
- **no scuffing or scoring of gear teeth**
- **reduced leakage . . . lower consumption . . . longer drain periods**
- **no foaming**
- **and the low activity additives are compatible with the finest base oils available—they stay combined with the oil and will not filter out!**



D·A
D·A
D·A
D·A
D·A

Lubricating heavy-duty equipment across the nation since 1919.

D-A LUBRICANT COMPANY, INC. • INDIANAPOLIS 23, IND.



EXTENSIVE TESTS ESTABLISH VALUES for MANNING's n

There has been considerable loose talk lately about "new" values for Manning's *n* when figuring flow coefficients for sewer lines. Manufacturers of one substitute material for lifetime Vitrified Clay Pipe say their pipe has a lower *n* factor, allowing flatter grades or smaller diameter pipe.

Independent tests show that this is not true.

For example, the new "Design and Construction of Sanitary and Storm Sewers"* manual contains a table entitled "Suggested Values of *n* for Manning's Formula." According to this table in the *new standard* for sanitary engineers, the range of values for *n* is **exactly the same** for lifetime Vitrified Clay Pipe and all normally used substitutes for this material.

Extensive tests just completed by independent researchers demonstrated this same point, as do other independent studies quoted at length in the manual.

Remember, there is no substitute for research. And there is no substitute for lifetime Vitrified Clay Pipe in your sewer lines.

**Prepared by a Joint Committee of the Water Pollution Control Federation and the American Society of Civil Engineers, 1960.*

COMPRESSION SEALED, VITRIFIED
CLAY IMPERVIOUS PIPE
THE STANDARD in SANITARY SEWERS

NATIONAL CLAY PIPE MANUFACTURERS, INC.
1028 Connecticut Ave., Washington, D. C.

Please send me complete details regarding actual values for Mannings *n*.

(name)

(company)

(street address)

(city and state)

B-3C23 EN

NATIONAL CLAY PIPE MANUFACTURERS, INC.
1028 Connecticut Avenue Washington 6, D. C.

not represent an overwhelming majority favoring land surveying as civil engineering. I believe I am correct when I state that the American Congress on Surveying and Mapping, the only national organization representing the surveyor and mapper, has accepted this report, but has not endorsed it.

No one can deny that surveying is a profession and the individuals in it should be improving their status. The improvements extend to education, proficiency, ethics, etc. While I am not saying that the civil engineering house is the place for the land surveyor, I am not saying that he should not be there either. I merely feel that the subject is still open to study, and the conclusions reached by this very fine report do not represent the majority thinking.

This letter is my personal thought and does not necessarily represent the thinking of my employer, or any professional group of which I am a member.

TOM DILLON
President, Texas Surveyors Association
Houston, Tex.

Soft Water and Heart Ills

SIR—I read with interest in your Construction Week column (ENR May 18, p. 31) that medical men may see a possible link between soft water and heart failure. I have been curious for quite some time now in regard to the possible deleterious effects of softened water on people of advanced age or with cardiac conditions since there is such a large stress at present on salt-free diet in these cases. It would seem to me that the displacement of the hard calcium and mangnesium radicals by the sodium radicals might be increasing the amount of sodium to the point where the intake of this softened water could become critical.

I would be interested in knowing if there is any other literature or data available on this.

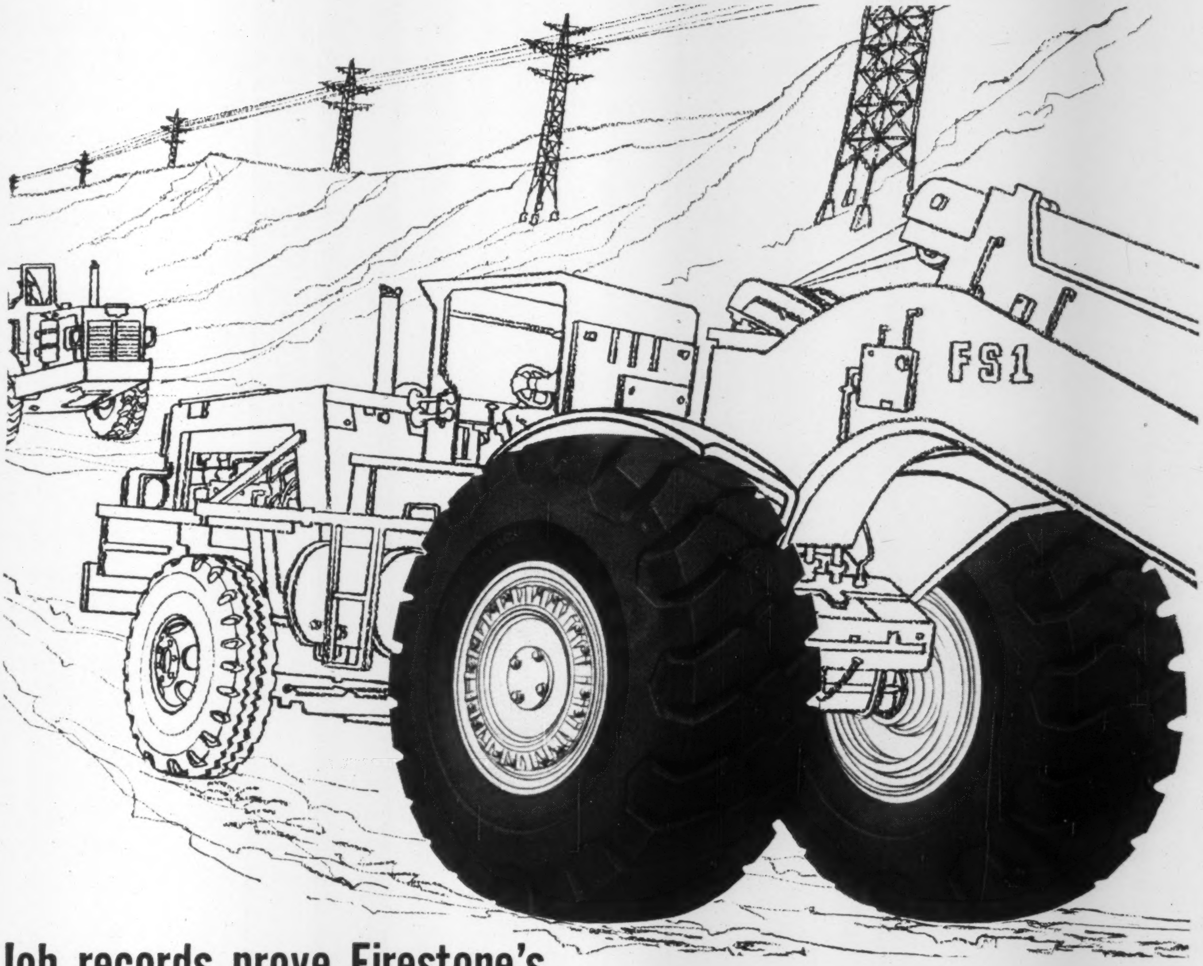
JACK L. STAUNTON
Consulting Engineer
Westport, Conn.

Bulldozer Blackmail

SIR—A soldier of fortune expects to win and collect a reward, or lose and be killed. There is no need to submit to Castro's blackmail (ENR June 1, p. 88) for "humane" reasons unless we have become so decadent that we are willing to pay millions for tribute and not one cent for defense.

The late Admiral Halsey recognized the value of the bulldozer. One of his first statements on arriving in the South Pacific in 1942 was to the effect that whichever side could move the most dirt would win the war.

(Reader Comment continued p. 34)



Job records prove Firestone's

TIRE TEAM KEEPS LOST YARDAGE DOWN!

1. **Firestone Giant Tires** work harder, last longer because they're built with exclusive Firestone Rubber-X. Longer wearing Rubber-X is more resistant to cuts, and teamed with *bonus-ply* Shock-Fortified cord bodies you get extra toughness and stamina to take tire-killing impacts hour after hour. That's why Firestone SUPER ROCK GRIP (WB) tires keep equipment rolling to keep production up, lost yardage down

2. **Firestone Giant Tire Service** puts an off-the-highway tire Specialist on your project 24 hours a day to handle all of your tire service needs and do the worrying for you. He'll help make your finish dates good!

Keep penalty day losses off your books—get Firestone's 1-2 Giant Tire Team working for *you!* Get more details from your Firestone Dealer or Store. Or write: Manager, Off-The-Highway Tires, The Firestone Tire & Rubber Company, Akron, Ohio.

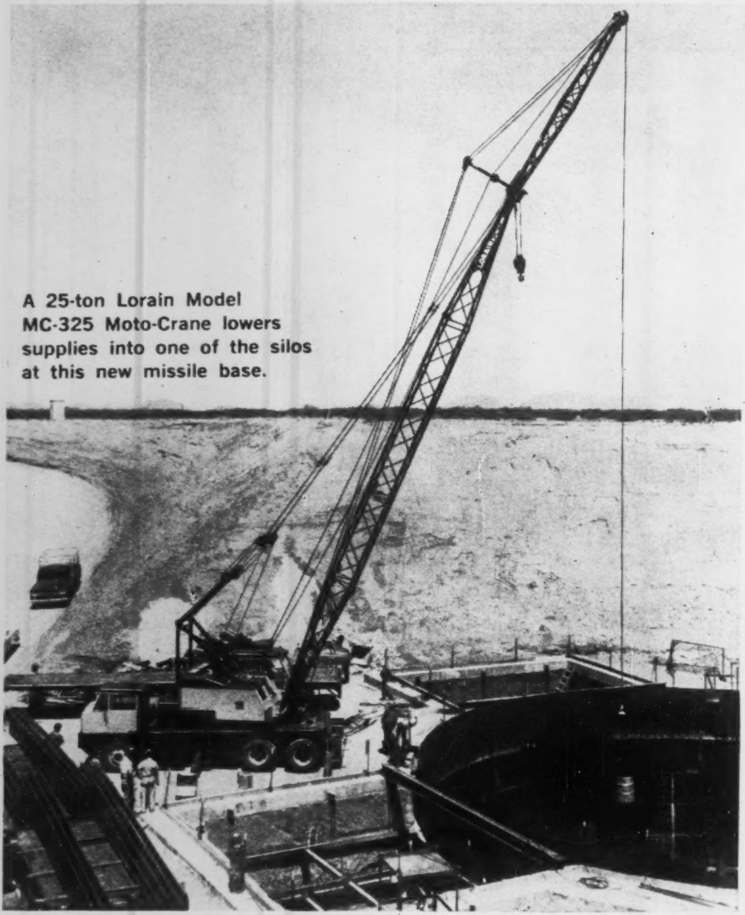
Always Specify Firestone Tires When Ordering New Equipment.

Firestone

FIRST IN OFF-THE-HIGHWAY TIRE NEEDS

Copyright 1961, The Firestone Tire & Rubber Company

NEW 25-TON MOTO-CRANES WORK ON DAVIS-MONTHAN AIR FORCE BASE TITAN MISSILE SITE



A 25-ton Lorain Model MC-325 Moto-Crane lowers supplies into one of the silos at this new missile base.

Two Lorain Model MC-325 Moto-Cranes are part of a fleet of 11 rubber-tire Lorains working on the $27,700,000 contract at the big Titan 11, phase 1 missile launching facilities near Tucson, Arizona.

There are 18 widely scattered sites in this vast complex and—as usual on the big jobs—Lorain Moto-Cranes are called on to scamper all over the project to get quickly to where they are needed, do their job, and hurry on to the next one! Cranes of from 25-ton to 75-ton capacity are in this fleet.

An important reason for the long-proven Moto-Crane ability to get the job done fast is Lorain's exclusive Power-Set® outriggers that eliminate manhandling and wasted time from job set-up procedure. Just imagine—roll in to the job, and from the time you step on the brake until you make your first lift can be as little as one minute. And it is done by power, without leaving the cab. No manhandling, no setting up of floats, no cribbing. On-the-job move ups are even quicker. Set up for maximum lifts as quickly as others do for "on-rubber" operation.

This time saver is standard or available on most Moto-Cranes. Why not ask your nearby Lorain distributor for a demonstration?

THE THEW SHOVEL COMPANY, LORAIN, OHIO

LORAIN®
DOES MORE
FASTER • FOR LESS

PLANTS in Lorain and Elyria, Ohio.
PRODUCTS—Power shovels, cranes, draglines, clamshells, and hoes on crawlers from 3/8- to 2½-yard capacity • Cranes from 7 to 80 tons . . . on crawlers, and as rubber tire Moto-Cranes, and Self-Propelled Cranes • Rubber tire front-end Moto-Loaders in 6,000-lb., 7,000-lb., and 9,000-lb. operating capacities.
OUTLETS—Lorain products sold and serviced by 249 distributor outlets throughout the world.

CIRCLE 24 ON READER SERVICE CARD

CIRCLE 25 ON READER SERVICE CARD→

In Merrie England 66′ Down—No Water In Site

Westminster Abbey and the Houses of Parliament overlook the site of the central tower in the Legal and General Assurance Society development, Westminster, London. ARCHITECTS: Ronald Fielding, F. R. I. B. A., London. STRUCTURAL ENGINEERS: Bylander Waddell & Partners, London. CONTRACTORS: Taylor Woodrow Construction Ltd., Southall, Middlesex.
1 ST. PAUL'S CATHEDRAL 2 WESTMINSTER ABBEY 3 VICTORIA TOWER

There certainly was cause for joy in Merrie Olde England when Taylor Woodrow Construction Limited made dry bottom 66 feet below street level through the help of Millars' dewatering engineers (our associates in England).

The men from Millars', like their counterparts at Foundation Wellpoint, know soil in all parts of the world. They're practical, experienced construction men . . . as we are. They know dewatering . . . as we do. They build soundly engineered wellpoint equipment. And they know how to speed up the job by applying this equipment and knowledge to "bad ground" conditions.

All this know-how, on either side of the Atlantic, can be put at your disposal when you pre-bid your next wet job or are faced with a tough dewatering problem.

When you call us in, we survey and analyze your dewatering problem by an inspection of the site, boring samples, specifications and plans. We then furnish an estimate of a wellpoint system layout designed to meet your requirements, on a rental or sale basis, that will enable you to bid or handle that wet job with confidence—and profit.

FOUNDATION | WELLPOINT CORPORATION

Solving dewatering problems for 35 years

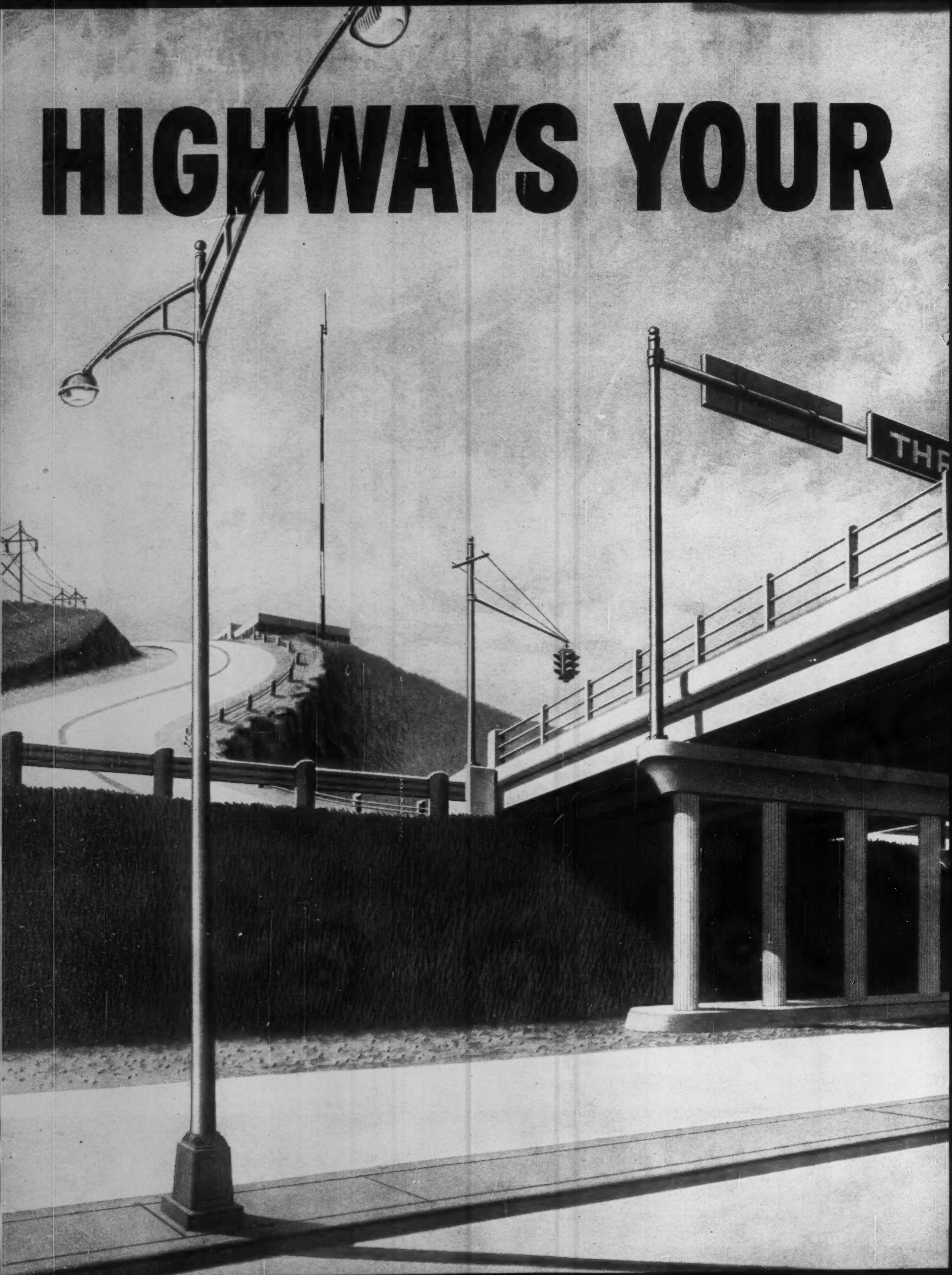
38th Avenue and 10th Street, Long Island City 1, N. Y. Chicago, Illinois · Fort Pierce, Florida

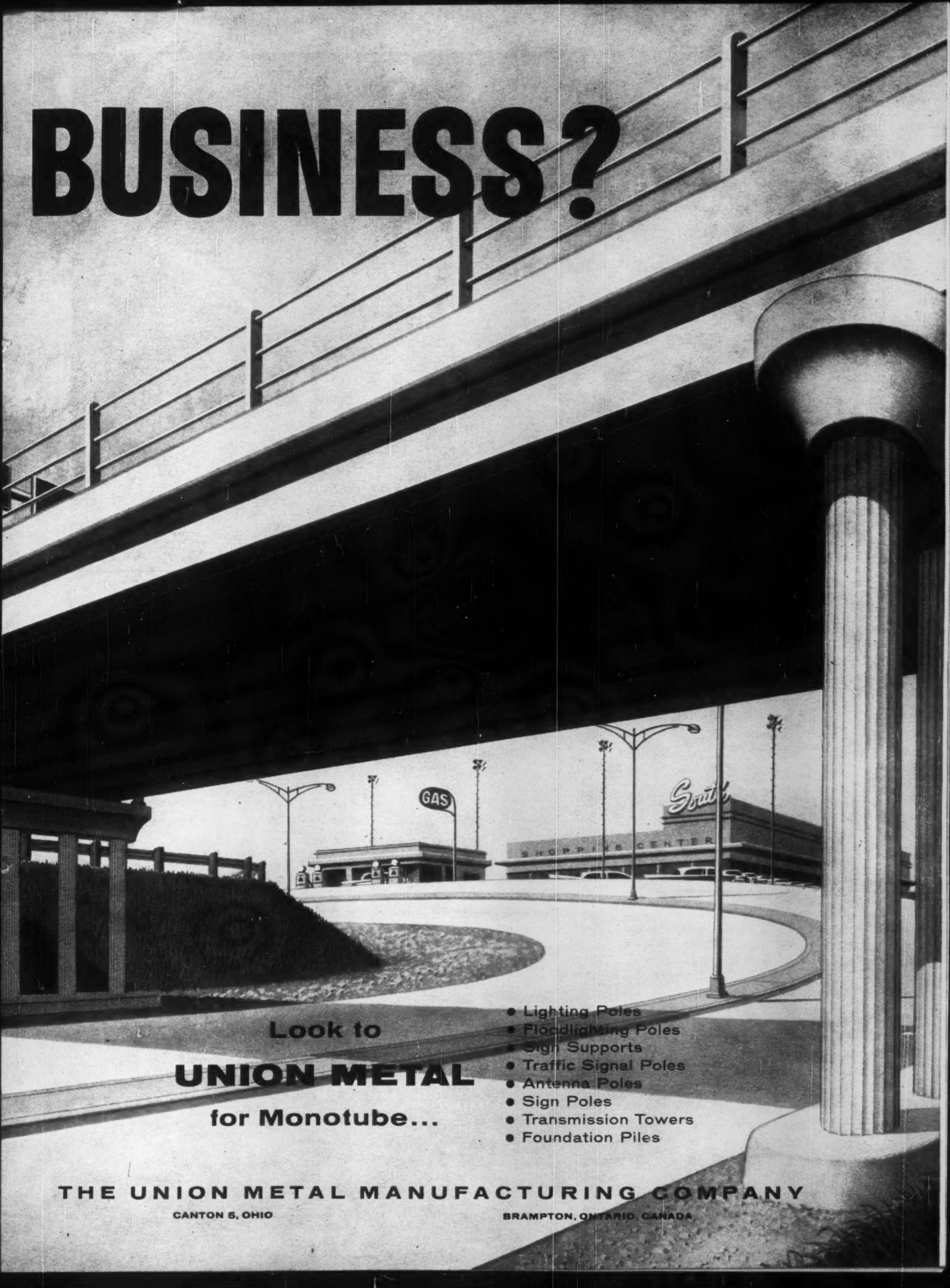
OVERSEAS ASSOCIATES

MILLARS' MACHINERY COMPANY, LTD., London, England

South Africa; Australia; India;
Egypt; Spain; France; Malaya

HIGHWAYS YOUR





BUSINESS?

Look to

UNION METAL

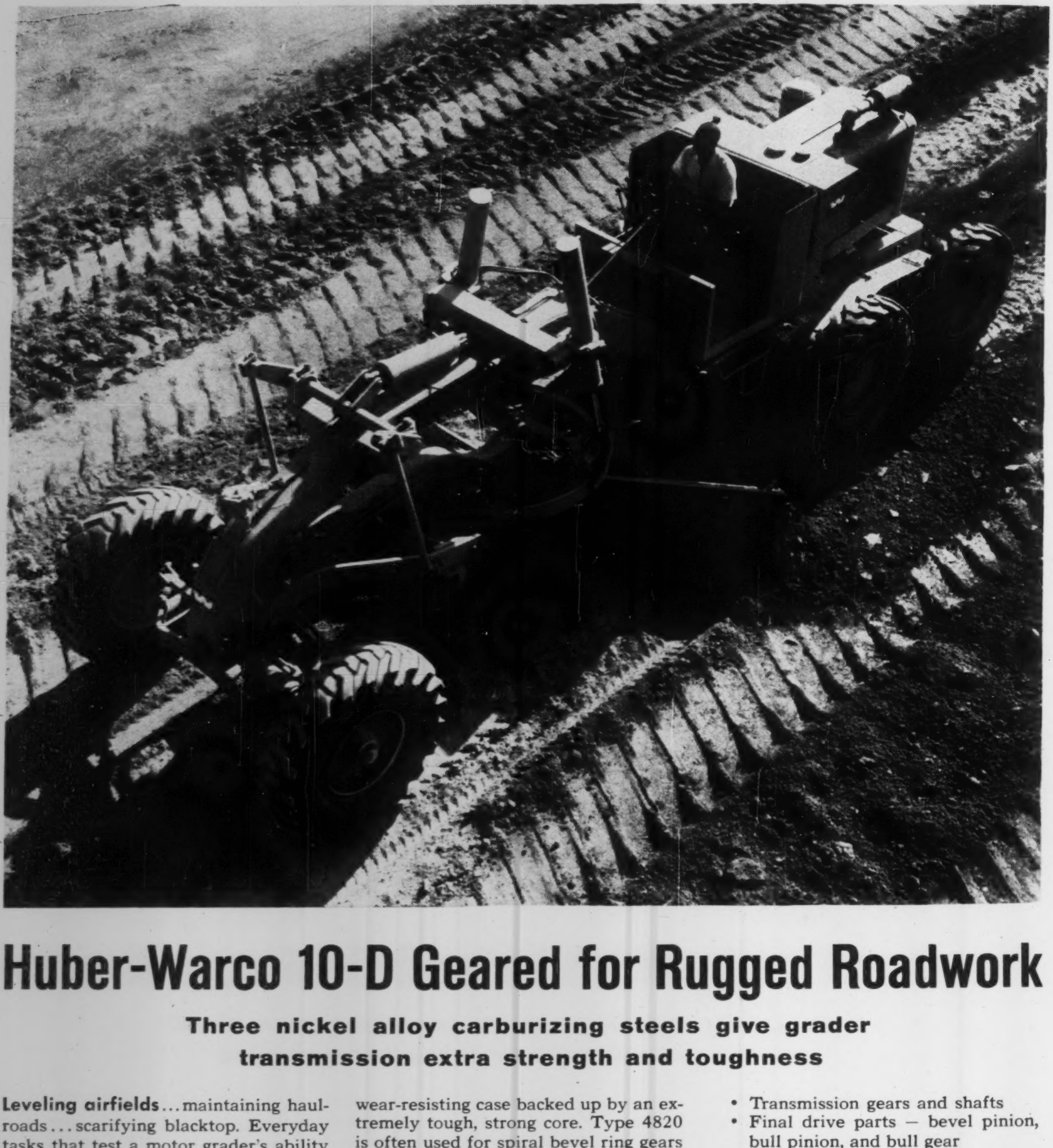
for Monotube...

- Lighting Poles
- Floodlighting Poles
- Sign Supports
- Traffic Signal Poles
- Antenna Poles
- Sign Poles
- Transmission Towers
- Foundation Piles

THE UNION METAL MANUFACTURING COMPANY

CANTON 5, OHIO

BRAMPTON, ONTARIO, CANADA



Huber-Warco 10-D Geared for Rugged Roadwork

Three nickel alloy carburizing steels give grader transmission extra strength and toughness

Leveling airfields... maintaining haul-roads... scarifying blacktop. Everyday tasks that test a motor grader's ability to survive shock and stress.

Engineers at H-W anticipated heavy operating loads at the design stage. To give the 10-D grader built-in strength and toughness they specified heat-treated nickel steels for critical transmission gears and shafts.

For the spiral bevel ring gear they selected AISI 4820 steel (3½% nickel). This carburizing steel develops a hard, wear-resisting case backed up by an extremely tough, strong core. Type 4820 is often used for spiral bevel ring gears where operating compressive loads approach 300,000 psi.

For less heavily stressed parts H-W specified AISI 4620 and 4320 carburizing steels (1.8% nickel). Readily heat-treated to a case hardness of 60 Rc min., these steels develop core properties adequate for all but the highest operating stresses. Here is where they are used in the 10-D:

- Transmission gears and shafts
- Final drive parts — bevel pinion, bull pinion, and bull gear

When you design, build or order construction equipment, bring nickel alloy steels in on the planning stage. You'll find materials-engineering data on 11 types of heavy construction equipment in a new, 76-page Inco booklet. For a free copy, request "A-265."

THE INTERNATIONAL NICKEL COMPANY, INC.

67 Wall Street INCO New York 5, N. Y.

INCO NICKEL

NICKEL MAKES ALLOYS PERFORM BETTER LONGER

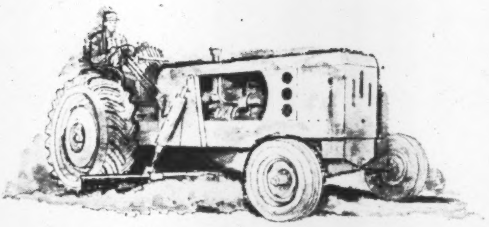
←CIRCLE 26 ON READER SERVICE CARD CIRCLE 28 ON READER SERVICE CARD CIRCLE 29 ON READER SERVICE CARD→

Real versatility... nine machines in one

Whether it's street, road or highway, maintenance or on construction jobs, versatility is important. The fewer machines needed to complete the job, the lower the overall costs. Versatility is one of the reasons the Huber-Warco M-52 Maintainer, with power sliding moldboard and torque converter, is so popular throughout the world. This power-packed 45½ H.P. workhorse is a real profit maker . . . virtually nine machines in one. Time and time again maintainer owners have remarked on the ability of their M-52's to outperform machines that are larger, heavier, more expensive and more costly to operate. The M-52, with hydraulically controlled attachments, can be used year 'round as a grader, lift-loader, scarifier, bulldozer, broom, side dozer, patch roller, snow plow or berm leveler. Why not see your Huber-Warco distributor at your first opportunity — he'll be glad to give you all the details as well as a demonstration.

HUBER-WARCO COMPANY • MARION, OHIO, U.S.A.

HUBER
WARCO

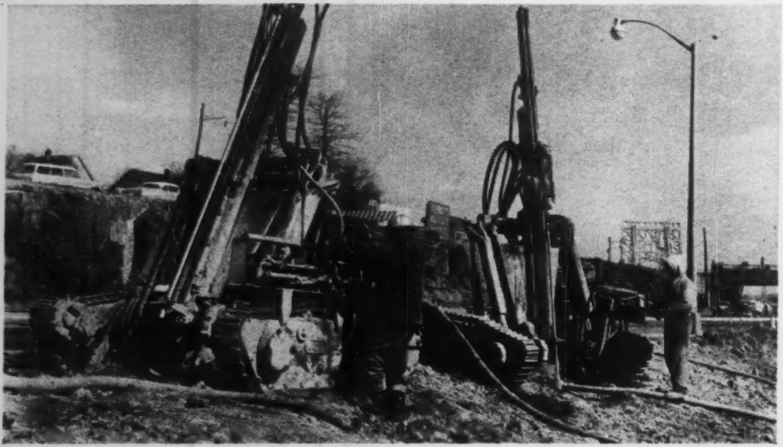


BUILT
FOR
PROFIT

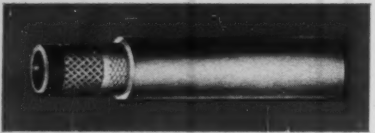
Keep jobs moving with THERMOID Big T Hose!

Whether you're drilling in an excavation or moving a mountain, your Thermoid Big T distributor has a complete line of hose for any construction job. Immediate delivery from stock holds downtime to a minimum. Call your Thermoid Big T distributor today!

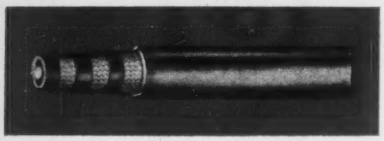
He also carries a complete line of V-belts, automotive hydraulic brake parts and fluid, brake shoes, fan belts and hose. Write: Thermoid Division, 200 Whitehead Road, Trenton 6, N. J., or telephone JUniper 7-3000.



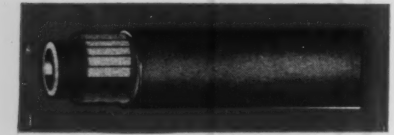
AIR HOSE to run everything from a tamper to a 6" rock drill



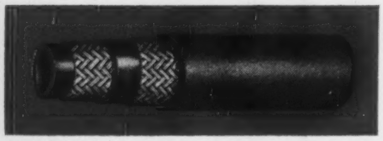
THUNDERBIRD. Tops for economy, durability and safety. For use with heavy air drills and pneumatic tools in the construction field. In 10 sizes from ⅜" to 4". Wire braid construction for high burst strength. Bright yellow cover for easy identification.



THERMINE. Built for rough jobs. Sturdy braids of high-tensile rayon, bonded by tight gripping friction, produces hose that won't twist or kink under pressure. In 8 sizes from ⅜" to 2". Working pressures to 360 p.s.i. Green neoprene cover.

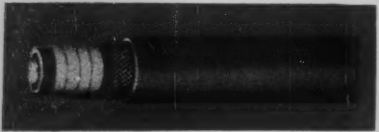


SUPER IRONSIDES. Designed especially for wagon drills and other heavy-duty air drills. All neoprene tube will not swell or flake under hot or oily conditions. In 11 sizes from ½" to 3". Has tough, red neoprene cover. Two plies braided steel wire for high burst resistance.

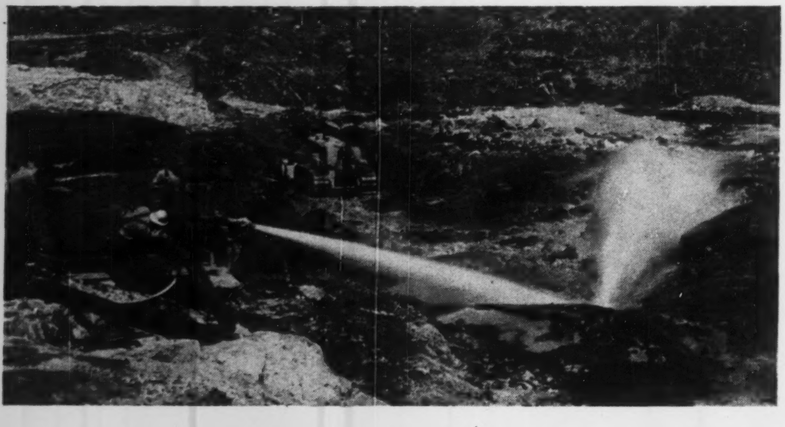


VERSICON. Most versatile hose made. Particularly for air-operated tools. Tube will not chip. High strength rayon reinforcement for highest pressure requirements. Red neoprene cover. Use with water, oil, grease, solvents or sprays. In 22 sizes from 3⁄16" to 1½".

ROADBUILDERS' HOSE handles water in any quantity



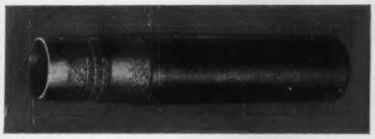
REDSKIN. Highly flexible, uniform inside diameter for full flow of water. Ideal for heavy-duty construction and road building use. Highly resistant to weathering and abrasion. Lengths to 50'. Sizes 1"-2". Maximum water pressures to 175 lbs.



CIRCLE 30 ON READER SERVICE CARD

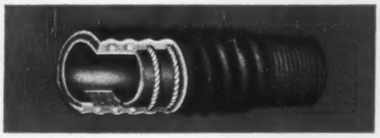
HOSE FOR SUCTION AND DISCHARGE
to pump any kind of slurry

CONTRACTORS Smooth Bore. For suction use in sewer, foundation, trench and road construction. Constructed with plies of heavy duck and steel wire. Compounded to resist water containing alkalies and acids. Lengths to 50′. Sizes to 12″.

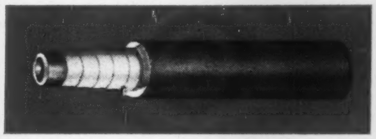


REVOLC. Light flexible suction hose. Easy to handle, yet rugged. Smooth rubber to insure maximum flow. Wire reinforced, horizontally braided. Resists kinking or crushing. Yet easily cut to any length. Lengths to 50′ in sizes from 1¼″ to 4″.

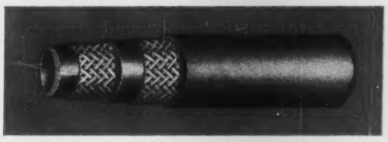
VICTOR CL. General purpose hose, heavy-duty suction or discharge service, up to 100 lbs. pressure. Withstands full vacuum and direct connection to centrifugal and piston pumps. Sizes: 1¼″ to 1½″ with molded cover; 2″ to 4″ with wrapped cover.



THERMOCORD. Especially adaptable for service where hose may be exposed to traffic or other crushing or pinching conditions. Snaps back to permanent shape when weight is removed. Sizes 1½″-3″.

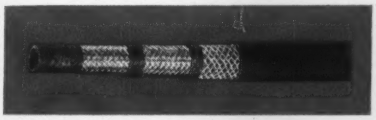


HERCULES. General discharge service at medium pressures in industry and general construction. Particularly suitable on centrifugal and diaphragm pumps. Lengths to 50′, sizes to 12″.

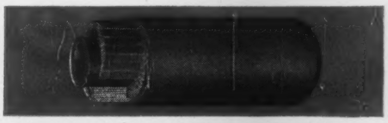


AQUAIR. A dependable, general purpose molded-type hose for medium to heavy duty use. Very flexible and easy to handle. Available in specified lengths or 500′ reels ¼″-1″, 250′ reels 1¼″-1½″.

PILE DRIVER HOSE
resists heat and oil



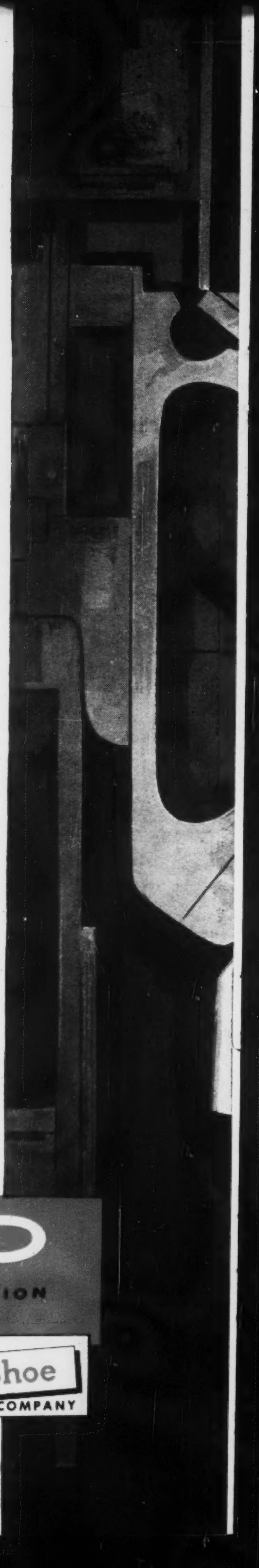
SUPER-IRONSIDES. Wire braided for strength. Operated with maximum working pressures to 200 psi. Designed to withstand effects of heat, pressure, pulsation and introduction of oil from jack hammers. In sizes, ½″ to 3″.



SUPER-EBONITE. Wrapped plies of heavy duck. Operates at working pressures of 150 lbs. Designed to resist effect of heat, pressure, pulsation and introduction of oil from jack hammers. Sizes, ½″-2½″.

THERMOID DIVISION PORTER H. K. PORTER COMPANY, INC.

200 WHITEHEAD ROAD, TRENTON 6, NEW JERSEY



Crush more tons per dollar . . .

BUY REPLACEMENT PARTS FROM THE COMPANY THAT BUILT YOUR CRUSHER

You buy a crusher because of the engineering experience the manufacturer has put into it to give you more production for your money. In the same way, the manufacturer of your crusher buys the experience and engineering abilities of the company which supplies certain components and replacement parts for it. The manufacturer profits only when *you* are satisfied with the performance of his product. That's why most big-name crushing equipment manufacturers work closely with AMSCO to give you replacement parts that fit perfectly, assure original equipment performance, and last a long time in the toughest conditions.

When it comes to wear parts, here's why most manufacturers insist on AMSCO. As long-experienced specialists in wear-resistant metals, AMSCO *engineers* alloys to exact formula needed to stand up under the abrasion-impact-pressure crushing conditions of your job. AMSCO cast parts are structurally perfect and contain the proper alloys for longest possible life.

AMSCO parts are patterned from manufacturer's drawings. They are built for *your* crusher . . . not copied from inaccurate field measurements. When you need mantles, concaves, jaws, rolls, plates or liners, get them from the manufacturer who built your crusher. He depends on AMSCO's experienced way with wear-resistant alloys *to help you crush more tons per dollar.*

They're backed by experience...

AMSCO

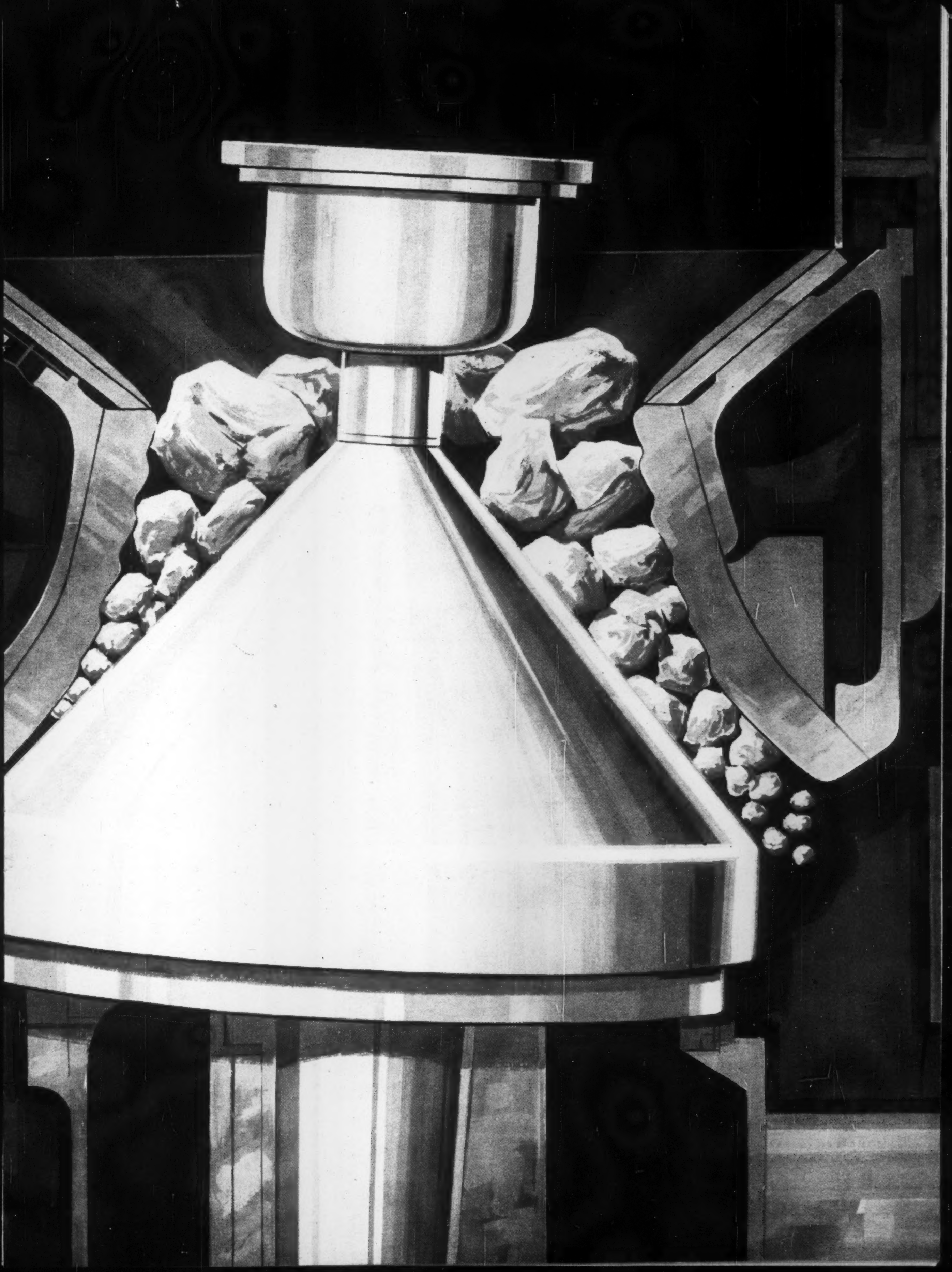
AMERICAN MANGANESE STEEL DIVISION
CHICAGO HEIGHTS, ILLINOIS

AMERICAN
Brake Shoe
COMPANY

Other Plants in:
Denver • Los Angeles • New Castle, Del. • Oakland, California • St. Louis
IN CANADA: Joliette Steel and Manitoba Steel Foundry Divisions
IN MEXICO: Amsco Mexicana, S. A.

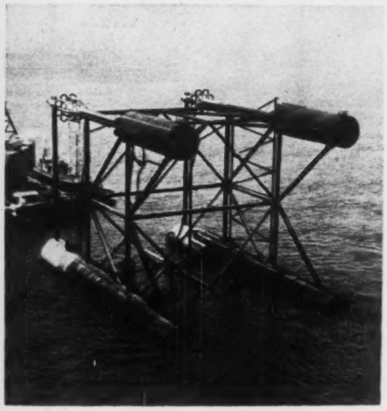
181

CIRCLE 32 ON READER SERVICE CARD



I am not in disfavor of bulldozers for Castro per se. I am just not in agreement with specifications and shipping instructions. When the Tractors for Freedom organization agrees to supply Castro with large dozers fully fueled, and delivered from an elevation of 10,000 ft without chutes, I'll send in my donation.

R. B. McDonnell
Taylor, McFarland—Johnson
Tucson, Ariz.



Another Tower Tilted

Sir—Your article on the Texas Shower No. 4 (ENR May 11, p. 18) contains a statement that is either incorrect or misleading.

In describing the construction of the tower, you state: "Major hazards were present at two stages of the erection . . . The first occurred in the method (never used before *or since*) of floating the three-legged substructure assembly in horizontal position to the site and there upending it to stand in vertical position on the ocean floor. Tilting the assembled structure imposed stresses that could not be calculated, the witness observed."

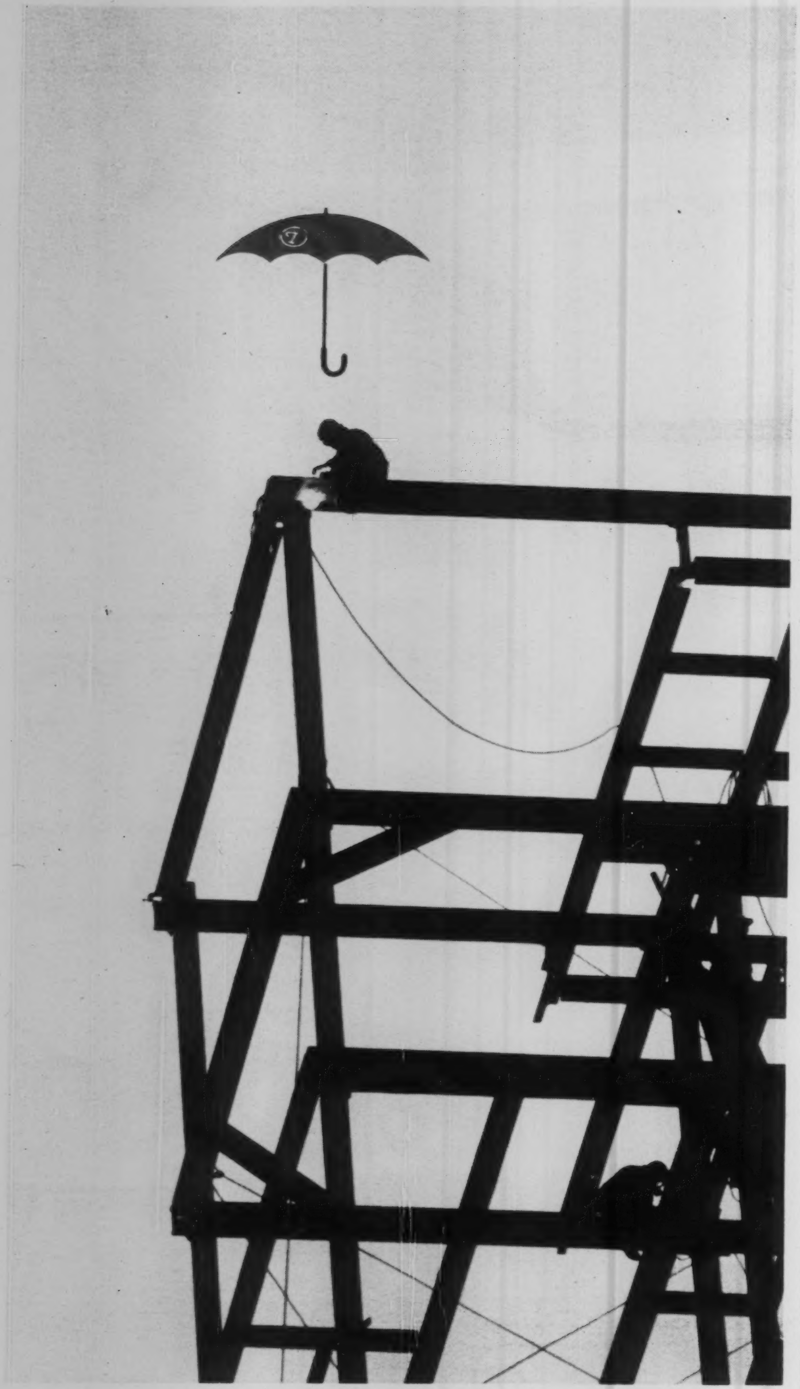
Yuba Erectors erected a four-legged tower for the Standard Oil Co. of California off the coast of Santa Barbara in July of 1960 (after Texas Tower No. 4 was built). The accompanying picture shows it being towed to its site.

The fact that it is a four-legged tower and not a three-legged tower has nothing to do with the inability to calculate the stress that would be imposed by the tilting operation.

We at Yuba know nothing of the collapse of the Texas Tower No. 4 and do not wish to be involved in that discussion in any way other than to point out that other towers have been erected in a similar method since Texas Tower No. 4.

F. J. Murphy
General Manager
Yuba Erectors
Emeryville, Calif.

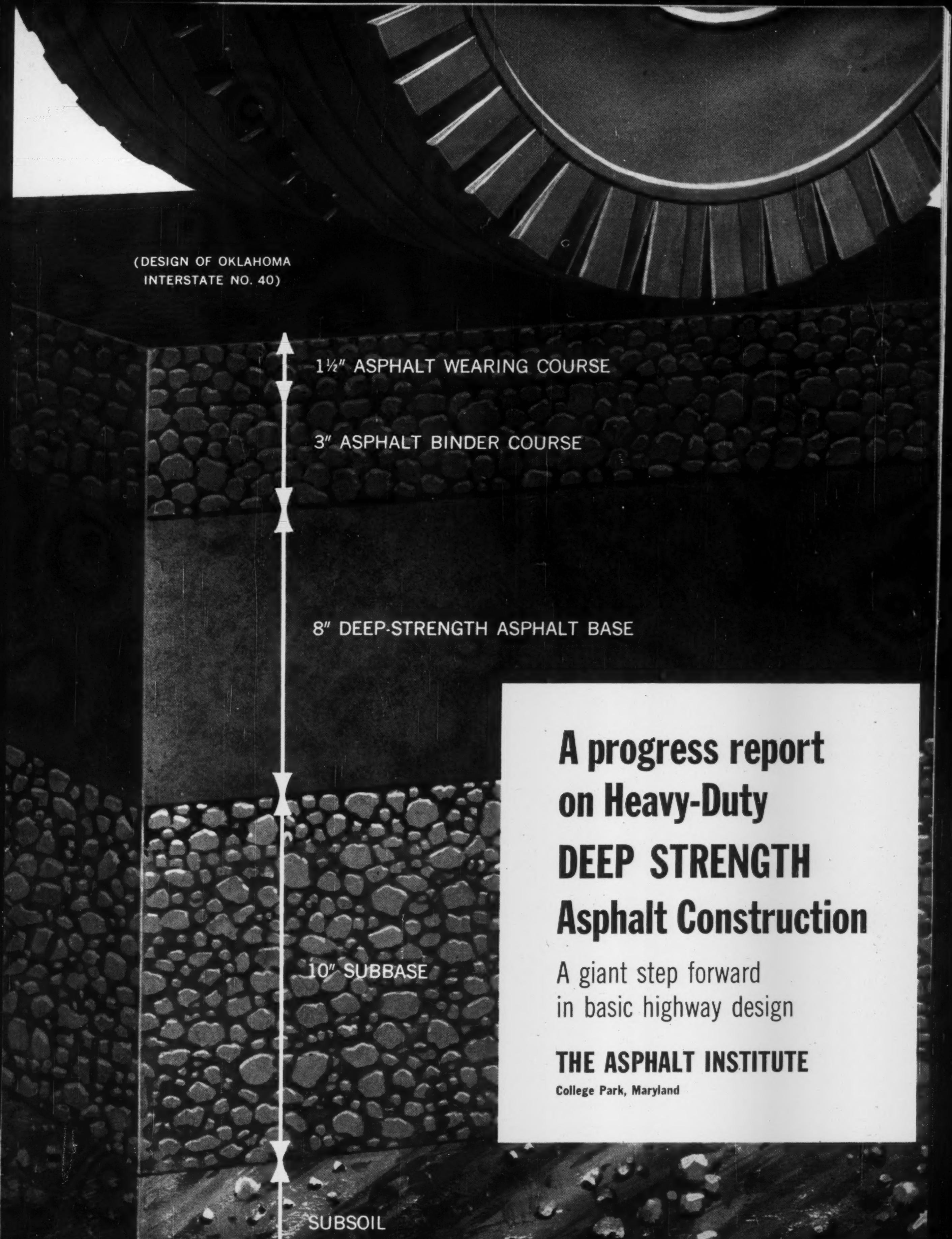
(*Reader Comment continued p. 43*)



How safe? Let The Travelers safety experts tell you. They'll study safety problems on your jobs to help keep accidents to a minimum and to help keep *you* out of lawsuits. When someone does get hurt, Travelers handles Workmen's Compensation and Public Liability claims for you—swiftly! You can also get Bid Bonds, Builders' Risk Insurance, Contractors' Equipment Floaters—in fact, practically any kind of business insurance you need—all from The Travelers. See your Travelers man.

THE TRAVELERS Insurance Companies HARTFORD 15, CONNECTICUT

CIRCLE 34 ON READER SERVICE CARD


(DESIGN OF OKLAHOMA INTERSTATE NO. 40)
1½″ ASPHALT WEARING COURSE
3″ ASPHALT BINDER COURSE
8″ DEEP-STRENGTH ASPHALT BASE
10″ SUBBASE
SUBSOIL

A progress report on Heavy-Duty DEEP STRENGTH Asphalt Construction

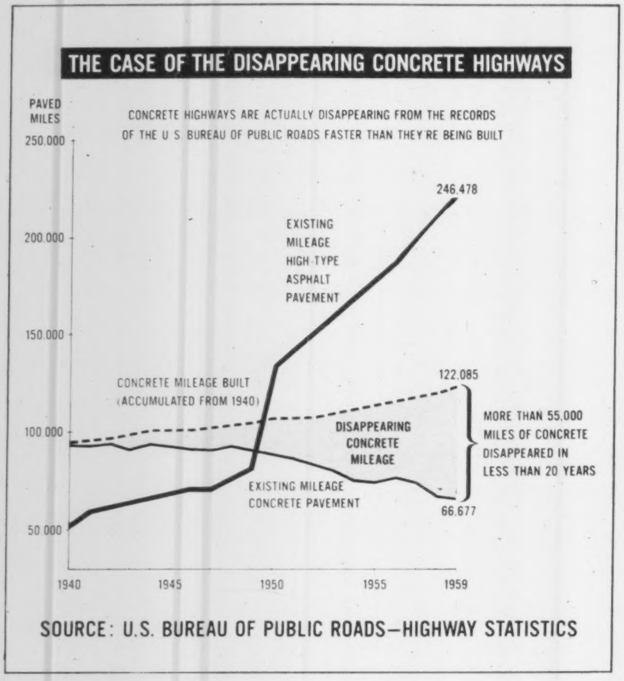
A giant step forward in basic highway design

THE ASPHALT INSTITUTE

College Park, Maryland

ASPHALT MILEAGE SOARS AS CONCRETE DWINDLES

THE CASE OF THE DISAPPEARING CONCRETE HIGHWAYS



SOURCE: U.S. BUREAU OF PUBLIC ROADS—HIGHWAY STATISTICS

HIGH-TYPE Asphalt-paved mileage on the state highway systems has more than tripled since the end of World War II.

This is the story of figures compiled by The Asphalt Institute from summary statistics published annually by U.S. Bureau of Public Roads.

In 1945, high-type Asphalt paving totaled 68,245 miles. But by 1959 this total had soared to 246,478 miles, as reported in the latest edition of the Bureau's "Highway Statistics." This increase reflects the rising popularity of this modern type of pavement.

STEADY DECLINE OF CONCRETE

From an all-time peak of 95,740 miles in 1942, existing mileage of portland cement concrete surface on the state systems has dwindled steadily to 66,677 miles by 1959, despite the construction of more than 30,000 miles of new concrete pavement during this period.

HEAVY-DUTY DEEP-STRENGTH ASPHALT PAVEMENT MILEAGE SPECIFIED THROUGHOUT U.S. TO MEET NEEDS OF INCREASING TRAFFIC

Today's greater wheel pressures and the demands of ever-increasing traffic call for advanced design heavy-duty Asphalt pavement. The solution: Asphalt "Advanced Design Criteria" or **"Deep-Strength"** Asphalt Construction featuring: 1) Asphalt Bases; 2) Drainage Improvement; 3) Controlled Compaction.

Design experience from across the country and results of many tests have been used to develop this extra-heavy-duty pavement construction which is the logical and proven answer to the challenge of increasingly heavier wheel and traffic loads.

The pages following give you several detailed accounts of the ways modern **"Deep-Strength"** Asphalt construction has been successfully used throughout the U.S. to solve difficult engineering problems of climate, traffic load, variations in terrain and material requirements.

THE ASPHALT INSTITUTE
College Park, Maryland

CIRCLE 36 ON READER SERVICE CARD

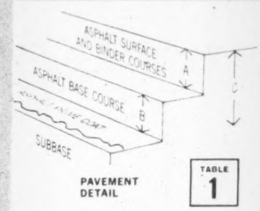
"DEEP-STRENGTH" ASPHALT CONSTRUCTION

. . . a giant step forward in basic highway design

- Lower stresses on subgrade
- Reduces total pavement structure thickness
- Improves many lower-quality aggregates*
- Is not susceptible to frost damage
- Protects subbase from rain during construction
- Permits haul traffic on base without damage
- Eliminates subsurface moisture build-up
- Aids uniformity of pavement
- Does away with shoulder erosion
- Minimizes slope erosion
- Furnishes better drainage
- Prevents wheel-track rutting
- Provides for stage construction
- Improves surface riding qualities
- Increases driving and parking safety

*For use in areas where high-quality aggregates are in short supply

SUMMARY OF ADVANCED DESIGN CRITERIA for "DEEP-STRENGTH" ASPHALT PAVEMENTS



PAVEMENT DETAIL

TABLE 1

Recommended Minimum Thicknesses of Surface-Plus-Binder and of Base Courses (inches)*

TRAFFIC	A**	B w. Asph base	B w/o Asph base	C w. Asph base	C w/o Asph base
Very Hvy	4	4	6	8	10
Heavy	3	3½	5	6½	8
Medium	3	2	3	5	6
Light	2	2	3	4	5

*For thickness of subbase and improved subgrade courses, see Asphalt Institute Manual Series No. 1

**May be reduced by substitution of Asphalt base of comparable strength on inch-for-inch basis

TABLE 2

RECOMMENDED MINIMUM COMPACTION CRITERIA* (summary)

Non-Asphalt Courses

COURSE	MINIMUM (% modified AASHO Density)
Subgrades (layers not to exceed 6 inches)	
Cohesive	95%, top 12 inches 90%; balance of fill (When optimum moisture is near plastic limit, compact at moisture content approximately 1% below theoretical optimum)
Cohesionless	100%, top 12 inches 95%, balance of fill
BASES, SUBBASES AND IMPROVED SUBGRADES (Layers not to exceed 6 inches)	
All	Compaction load and contact pressures as high as material will support without undue rutting or displacement
(proof roll with heavy rubber-tire rollers)	

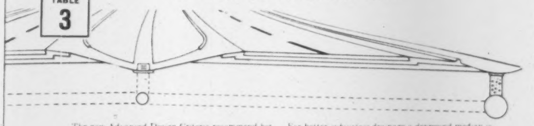
ASPHALT COURSES (base, binder, surface)

COURSE	MINIMUM CRITERIA
SUPPORTING COURSES	Flat steel wheel rollers to be supplemented with pneumatic tire rollers having average tire contact pressures of 85-110 psi
SURFACE COURSES	Same as for Supporting Courses

*For detailed information see The Asphalt Handbook, Manual Series No. 4

TABLE 3

FULL-WIDTH DRAINAGE (Typical Cut Section)



The new Advanced Design Criteria recommend better surface and subsurface drainage. For better *surface* drainage full-width paving is recommended. On elevated grades the water should be directed to Asphalt spillways by means of Asphalt dykes or curbs constructed on the extreme outside edge of the shoulder.

For better subsurface drainage a depressed median is recommended wherever possible. If conditions make it mandatory to construct an elevated median, transverse drains should be connected with a longitudinal drain in the median deep enough to collect all ground water before it can find its way into the pavement structure.

"THE INCREASING STRESSES now being imposed on pavements by modern heavy traffic with average tire contact pressures as high as 100 psi or more, and the anticipated future increase in wheel coverages indicate that general improvements in design and construction must be made. To meet this need, The Asphalt Institute calls to the attention of highway designers the Advanced Design Criteria given in broad detail above and designated, 'Deep-Strength' Asphalt pavements. The Institute strongly recommends the adoption of these Advanced Design Criteria in the construction of all future heavy-duty Asphalt pavements. For detailed data, you are urged to contact The Asphalt Institute District Engineer in your area."

Arvin S. Wellborn
CHIEF ENGINEER

NEW HANDBOOK! Now on the presses is a new edition of *The Asphalt Handbook*. It incorporates all the Advanced Design Criteria for highways implied by the term **Deep-Strength** Asphalt Construction. It also includes the latest design and research data concerning other major uses of Asphalt . . . for ditch linings, embankment facings, etc. Copies will soon be available at The Asphalt Institute office serving your area.

Ribbons of velvet smoothness . . .
ASPHALT-paved Interstate Highways

THE ASPHALT INSTITUTE
Executive Offices and Laboratories
Asphalt Institute Building, College Park, Md.

ENGINEERING AID. The Asphalt Institute has District Engineering offices in the following locations. Call on your District Engineer to discuss your Asphalt problems at any time.

DIVISION I—ATLANTIC—GULF
NEW YORK 20, N. Y., 1270 Avenue of the Americas
BOSTON 16, MASS., 419 Boylston St.
ALBANY 7, N. Y., 11 North Pearl St.
HARRISBURG, PA., 800 North Second St.
RICHMOND 19, VA., Travelers Building
ATLANTA 9, GA., 881 Peachtree St., N.E.
MONTGOMERY 4, ALA., 79 Commerce St.
NEW ORLEANS 16, LA., Maison Blanche Building

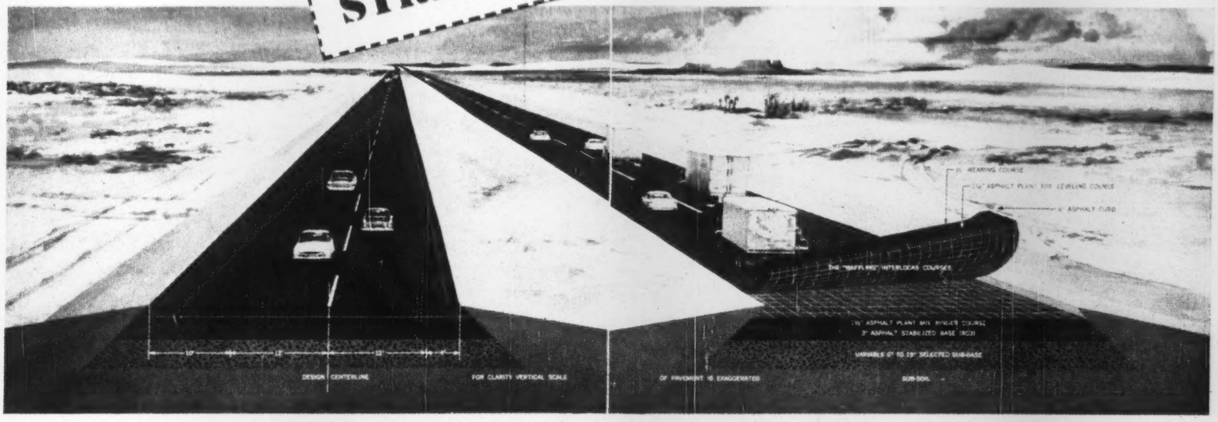
DIVISION II—OHIO VALLEY—GREAT LAKES
COLUMBUS 15, OHIO, Neil House
LANSING 16, MICH., 109 West Michigan Ave.
LOUISVILLE 7, KY., 4050 Westport Road

DIVISION III—MIDWEST
ST. PAUL 4, MINN., 1951 University Ave.
CHICAGO 39, ILL., 6261 West Grand Ave.
SPRINGFIELD, ILL., 2606½ South Sixth St.
KANSAS CITY 3, KANS., 1500 [illegible] Drive
DENVER 2, COLO., 1031 19th St.
PIERRE, S. DAK., 104 S. Euclid Ave.
HELENA, MONT., Power Block

DIVISION IV—SOUTHWEST
DALLAS 6, TEX., Meadows Building
AUSTIN 1, TEX., Perry Brooks Building
OKLAHOMA CITY 2, OKLA., Republic Building
SANTA FE, NEW MEXICO, 10 Radio Plaza

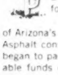
DIVISION V—PACIFIC COAST
BERKELEY 10, CALIF., 810 University Ave.
LOS ANGELES 17, CALIF., 1709 West 8th St.
OLYMPIA, WASH., National Bank of Commerce Building
SACRAMENTO 14, CALIF., Forum Building
PORTLAND 1, OREG., 1033 S.W. 18th Ave.

DEEP STRENGTH


10'
12'
12'
4'
DESIGN CENTERLINE
FOR CLARITY VERTICAL SCALE
OF PAVEMENT IS EXAGGERATED
½" WEARING COURSE
1½" ASPHALT PLANT MIX LEVELING COURSE
6" ASPHALT CURB
THE "WAFFLING" INTERLOCKS COURSES
1½" ASPHALT PLANT MIX BINDER COURSE
3" ASPHALT STABILIZED BASE (RC3)
VARIABLE 6" TO 19" SELECTED SUB-BASE
SUB-SOIL

Arizona's First Interstate Segment Asphalt-Paved!

Experience with veteran 2-lane Asphalt pavements leads to decision



Arizona is a big state with a low population density—which means it needs plenty of roads. But there aren't millions of Arizonans to pay for them. Every dollar counts.

These are some of the reasons why most of Arizona's roads traditionally have been of economical Asphalt construction. Time and again, since the State began to pave, Asphalt pavements have stretched available funds over more and more of these long Arizona miles than could any other pavement type.

Now, along with the rest of the states, Arizona has launched a vast new road-building program. And even though more federal aid is available than ever before, these roads, too, are turning out to be Asphalt-paved. You don't have to look far for the reasons.

Arizona's veteran Asphalt-paved highways have proved themselves as rugged and durable as they were economical to build and maintain.

U.S. Route 66 between Winslow and Holbrook is an example. First paved more than 25 years ago (with Asphalt and sand!), this pavement is successfully supporting heavy traffic undreamed of when it was first built. "Double" trucks by the dozen barrel over it at 60 MPH. So does the bulk of Arizona's east-west traffic.

Now this veteran main artery, still in the prime of its life, is being given local traffic responsibilities. A new divided Interstate Highway (Route 40), carrying through traffic, will parallel it. The initial section of Arizona's new Interstate 40 is shown above. It is a 5.6 mile stretch between Winslow and Holbrook.

With no aggregate larger than ¾ inch available (and most under ¼ inch), only Asphalt construction could have been used to build this section of pavement up to Interstate standards. Total cost of the pavement structure was $1.75 per square yard!

The cross section above shows you in detail how low-cost Asphalt materials were used to give this pavement lasting strength despite the scarcity of aggregate.

Notice, first, the use of Asphalt in the 3-inch base. This base, a sandy gravel, was road-mixed on the selected sub-base using RC-3 liquid asphalt.

Notice, second, (see right roadway above) that the 3-inch binder and leveling course was asphalt plant mix laid down in two courses. A novel between-course interlock was provided by "waffling" the lower course while still hot with a 4-inch square grid pattern, impressed about ⅜-inch into the surface. A tack coat was applied and a second course constructed. Then, a ½-inch wearing course was laid to insure a non-skid surface.

Notice, third, that both base and surface courses are uniform across the whole width of the road, shoulders as well as traffic lanes.

Notice, fourth, the use of Asphalt curb to provide controlled drainage, prevent embankment erosion and aid safety.

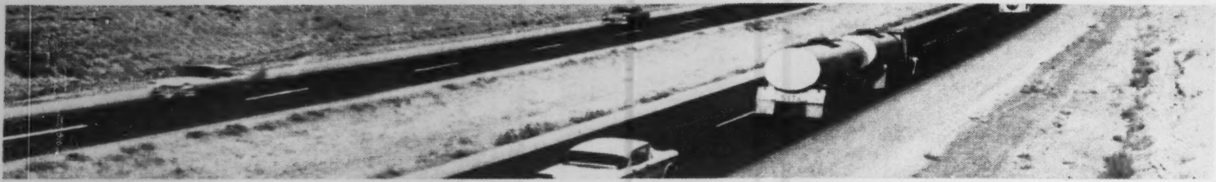
BEAT SCHEDULE BY TEN WEEKS

With today's equipment, modern heavy-duty Asphalt concrete pavement is being laid at record, reputation-building, tax-fund-conserving speeds. In this case, construction was completed 10 weeks ahead of schedule . . . in plenty of time to accommodate the bulk of the summer tourist traffic.

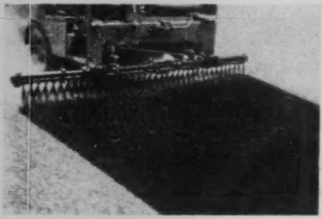
Modern Asphalt concrete pavement can help **you** speed your highway modernizing program. It provides, as well, strength, durability and economy in full measure. Specify it for your Interstate Highways. Primary and farm-to-market roads, too.

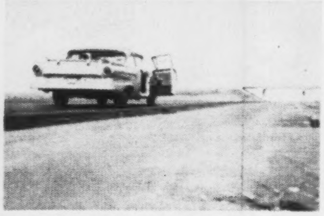
Ribbons of velvet smoothness . . .
ASPHALT-paved Interstate Highways

THE ASPHALT INSTITUTE
Asphalt Institute Building, College Park, Maryland



Oklahoma makes sure Interstate 40 can carry heaviest traffic for years!





First, primes subbase... then hot mixes... and hot lays... 8-inch Asphalt base

Here's a pavement with future!

For years to come, it's sure to carry the heaviest traffic without distress. Built to do so. With an Asphalt base to reduce stresses imposed on the subgrade.

This type construction is recommended to prevent accumulation of capillary moisture and water vapor in the pavement courses where high strength is required.

Builds up strength layer by layer

After proper compaction of the A-7-6 subgrade, ten inches of subbase (10-16 CBR) were placed full width of the roadbed. This subbase was primed with 0.2-0.4 gals./sq. yd. of MC-1 to insure bond with the succeeding high-strength Asphalt base course.

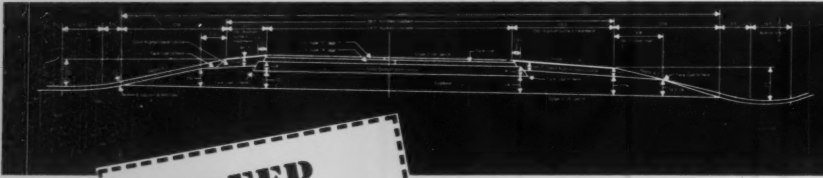
Then four 2-inch courses of hot-mixed sand-Asphalt base (Hveem stability, 26-27) were laid.

After tacking the base with diluted Asphalt emulsion, two courses (4½ inches total) of Asphalt Concrete were placed to form the traffic lanes. The shoulders were built up with 7 inches of sand-Asphalt base course and given a double surface treatment to provide clear visible demarcation.

Engineering Advantages

Next time you are in Oklahoma, join the heavy traffic streaming over this pavement and see for yourself how modern Asphalt pavement is engineered for tough, longer-lasting service. You'll find the section (Interstate 40) just west of Clinton. You'll find it wonderfully smooth riding, a pleasure to drive on.

With modern Asphalt construction you can build the finest pavements engineering skill and know-how can provide. Pavements that give taxpayers the most for the money, in lower first costs, lower maintenance costs, longer life, safety and riding comfort. And be sure of this: no material is comparable in design versatility or in ease of construction. Its use **is modern** engineering.



"Ribbons of velvet smoothness"
ASPHALT *paved Interstate Highways*

THE ASPHALT INSTITUTE
Asphalt Institute Building, College Park, Maryland

DEEP STRENGTH

FINISHED ROADWAY on California Interstate Highway 15. Asphalt dikes and embankment on right show unusual drainage design to combat flash floods in Baker Sink region of high Mojave Desert plateau.

INTERSTATE
15

CALIFORNIA HIGHWAY ENGINEERS SPECIFY DEEP STRENGTH ASPHALT CONSTRUCTION

Asphalt dikes and ditches to divert Mojave Desert flash flood water from Interstate Highway 15.

California's largest asphalt pavement highway contract used local aggregate crushed on site resulting in substantial economies.

For the 25.2-mile four-lane, divided limited access section of California Interstate Highway 15 that replaces U.S. Route 91 from 1 mile east of Baker, California, to 1 mile east of the Cima Road, engineers of the California Division of Highways chose the Advanced Design Criteria for modern DEEP STRENGTH Asphalt Construction.

Natural Obstacles . . . Location in southeastern California on the high eastern Mojave Desert plateau, with elevations from 1,000 to 4,000 feet, posed some unusual design problems. Temperatures range from 115° in summer to 25° in winter, rainfall averages only 4½ inches annually (which usually occurs as hard downpours).

Flash floods occur because rainwater reacts with minerals in the dry sand to form an impervious crust. The resulting rapid surface run-off must be controlled to prevent undermining of the roadway. California Division of Highways through many years of study has developed an effective solution to these unique drainage problems by use of diversion ditches and dikes.

DEEP STRENGTH Design . . . The cross section below shows how California engineers made use of the principles of DEEP STRENGTH Asphalt Construction. Note 4" surface and wearing courses with 3" asphalt-concrete base course. The 8" aggregate base and 6" subbase (where necessary) consist of *water-bound* layers of 1½" max. stone compacted with pneumatic rollers and steel tandem rollers. The 8" aggregate base is primed with 0.25 gal. per sq. yard of SC-2 before asphalt-concrete base course was spread. Total thickness is 15 inches to 21 inches depending on the subsoil.

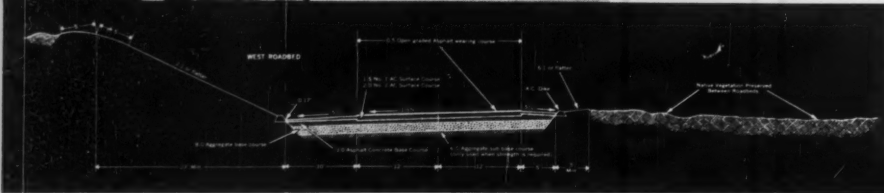
A median 90 ft. wide was used, with no treatment. (The crust and scant vegetation on median surface was kept intact to minimize erosion during periods of high surface run-off and or wind.) Outside shoulders are 10 ft. wide and paved. Inside shoulders have 2 ft. paved and 3 ft. unpaved. (In cut sections, 5 ft. wide, all paved.)

Taxpayer Saving . . . DEEP STRENGTH Asphalt Construction allowed California's engineers to use local aggregate crushed at the site. This, plus the inherent economy of Asphalt Construction, results in important savings for the taxpayer of California. And low future maintenance costs on DEEP STRENGTH Asphalt will provide additional tax savings.

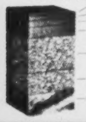
ASPHALT DIKES on shoulder edges direct surface water to drainage outlets.

STONE CRUSHERS make use of local aggregate found at site to offer California taxpayers important savings.

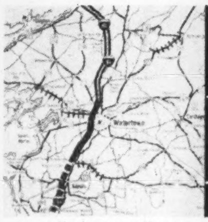
THE ASPHALT INSTITUTE Asphalt Institute Building, College Park, Maryland



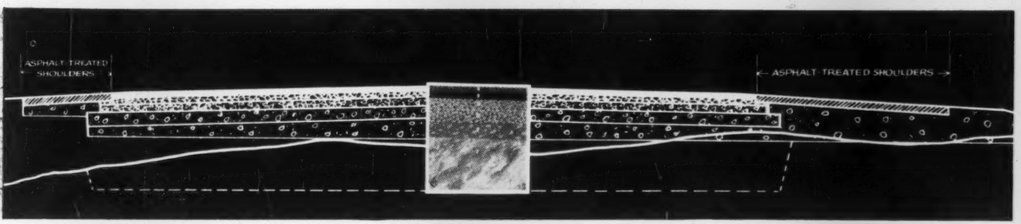
THIS IS DEEP STRENGTH DESIGN ON CALIFORNIA INTERSTATE 15



A. Wearing Course	0.5
B. No. 2 AC Surface Course	1.5
C. No. 1 AC Surface Course	2.0
D. Asphalt Concrete Base Course	3.0
E. Aggregate Base Course	8.0
F. Aggregate Subbase	6.0
G. Subgrade or Improved Subgrade	—
TOTAL MAXIMUM THICKNESS	21.0



Map shows location of Interstate #81 in Watertown area



Cross-section diagram shows composition of single 24-foot roadway on four-lane Interstate & Defense Highway #81. Note Asphalt-treated shoulders.

Look what they're doing with DEEP STRENGTH Asphalt Pavement in Upstate New York!

Advanced Asphalt Pavement design, over prepared subbase, solves problems in area where frost depth goes to 48 inches

Boulder-strewn glacial till near Watertown presented New York State Highway Department engineers with unusual problems. Here, winter temperatures often reach 20° to 25° *below* zero. The frost depth extends to 48 inches. In cuts, severe frost action sometimes forces boulders *through* the pavement with subsequent break-up and failure.

The cross-section and diagram on this page show how DEEP STRENGTH Asphalt pavement design solved the problems. Notice how the precepts of new DEEP STRENGTH Asphalt design are carried out. They include Asphalt base, Asphalt-treated shoulders, depressed median for good drainage and flat slope embankments for better safety. Capillary moisture action and frost damage are prevented by building the road structure with selected materials.

When designed like this—for DEEP STRENGTH—Asphalt pavements will carry the heaviest traffic loads without distress . . . with minimum maintenance cost. For example, the DEEP STRENGTH Asphalt-paved New Jersey Turnpike carried over 46 *million* vehicles during 1959.

SAVE MONEY, TOO! Modern low-maintenance DEEP STRENGTH Asphalt pavements often cost *less* to build than Asphalt pavements designed to other standards. That's because the Advanced Design Criteria often permit Asphalt base to be substituted for some of the more expensive Asphalt concrete surfacing, and allow reduction in total structure thickness when used in place of untreated base.

NEW HANDBOOK . . . a new edition of the *Asphalt Handbook* incorporating all the Advanced Design Criteria implied by the term DEEP STRENGTH Asphalt Construction soon will be available at the Asphalt Institute office serving your area.

ASPHALT HANDBOOK

THE ASPHALT INSTITUTE
Asphalt Institute Building
College Park, Maryland

THIS IS DEEP STRENGTH

A
2½-inch Asphalt concrete surface course

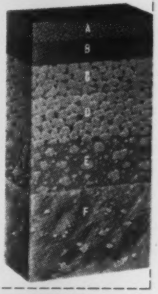
B
3-inch Asphalt base course

C
4-inch base course of broken stone

D
6-inch graded gravel subbase

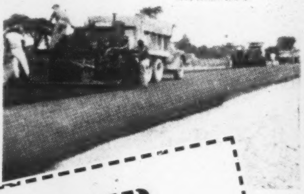
E
6-inch bank run gravel foundation course

F
Excavated to 48 inches below pavement grade in cuts—locally available backfill material compacted with "super" compactor

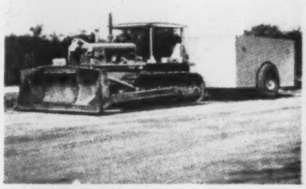


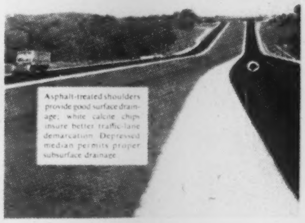
In cuts, engineers excavated below frost level and prepared subbase using suitable, locally available materials.

A 2½-inch Asphalt top course is applied over 3-inch plant-mixed Asphalt base and a 4-inch broken stone bottom course.



50-ton rubber tire "super" compactor used on all supporting courses to assure smoother riding under all traffic weights to come.





Asphalt-treated shoulders provide good surface drainage; white calcite chips insure better traffic-lane demarcation. Depressed median permits proper subsurface drainage.

DEEP STRENGTH

LOOK WHAT THEY'RE DOING WITH DE ALT PAVEMENTS IN WESTERN KANSAS!

To withstand heavy traffic,
sizzling heat, numbing cold . . .

11-inch sand-Asphalt base is chosen for Kansas Interstate 70

Traffic will soon be rolling on a new DEEP STRENGTH Asphalt pavement section of Interstate 70 in Trego County, Western Kansas. In this part of the country, temperatures range from a numbing 20 below zero in winter, to sizzling 115°F in summer; winds sometimes reach hurricane force.

To meet the demands of expected heavy traffic and extreme weather, Kansas Highway Commission Engineers chose DEEP STRENGTH Asphalt pavement. Notice construction and cross-section (below). See how precepts of the new DEEP STRENGTH Asphalt design are incorporated . . . heavy-duty, **full width** Asphalt Concrete surface . . . **11-inch heavy-duty, sand-Asphalt base** . . . heavy compaction . . . good drainage. Here is strength and durability!

Minimum Maintenance

When built like this—for DEEP STRENGTH—Kansas experience has shown that Asphalt pavement will carry the heaviest traffic loads *without* distress and *with minimum maintenance.*

Make Best Use of Road-building Dollars

Like many other states, Kansas is finding that when Interstate highways are built with Advanced Design DEEP STRENGTH Asphalt pavements, the best use is made of road-building funds. For the Advanced Design Criteria for Asphalt pavements often save money over the cost of Asphalt pavement designed to other standards. The reason is the Advanced Design Criteria permit inexpensive Asphalt base to be substituted, within limits, for more expensive Asphalt concrete surfacing, and allow reduction in total structure thickness when used in place of untreated base.

New Handbook

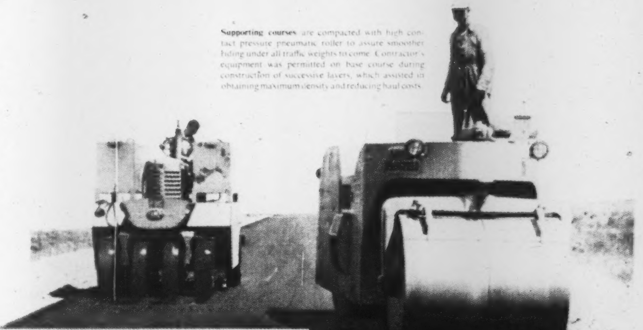
A new edition of the *Asphalt Handbook* incorporating all the Advanced Design Criteria implied by the term DEEP STRENGTH Asphalt pavement is now available at the Asphalt Institute office serving your area.

THE ASPHALT INSTITUTE
ASPHALT INSTITUTE BUILDING, COLLEGE PARK, MARYLAND

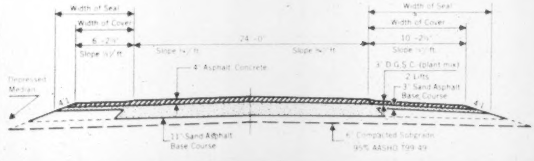
Subgrade was compacted and fine-graded before road-mixing of sand-Asphalt base.

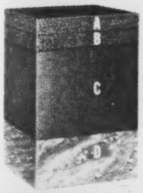
Local sand shaped in windrow, bladed to reduce moisture to less than 1%, reshaped into windrow, mixed with Asphalt through traveling mixer—aerated and compacted.

Supporting courses are compacted with high contact pressure pneumatic roller to assure smoother riding under all traffic weights to come. Contractor's equipment was permitted on base course during construction of successive layers, which assisted in obtaining maximum density and reducing haul costs.



TYPICAL PAVING SECTION





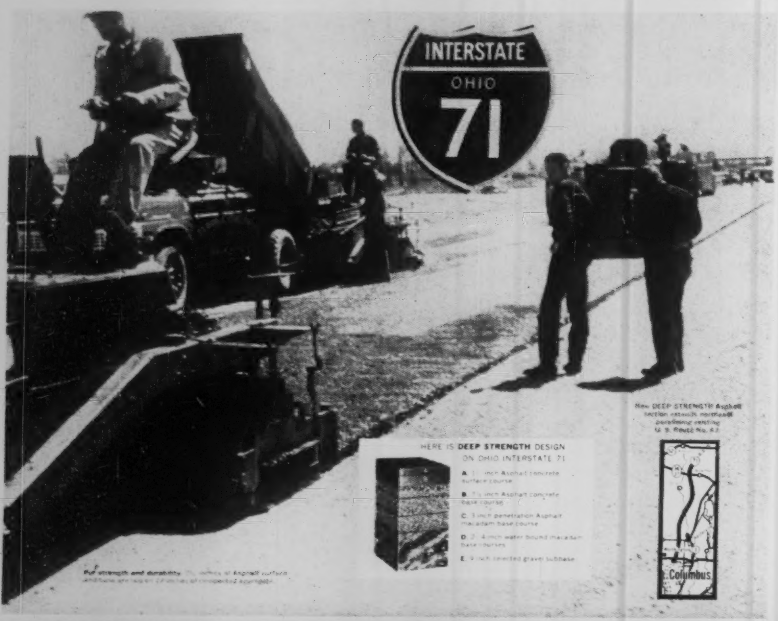
THIS IS DEEP STRENGTH CONSTRUCTION

A
2 inch surface course

B
2 inch binder course

C
11 inch sand Asphalt base

D
Subgrade


INTERSTATE
OHIO
71
HERE IS DEEP STRENGTH DESIGN ON OHIO INTERSTATE 71
A. 1½ inch Asphalt concrete surface course
B. 7½ inch Asphalt concrete base course
C. 3 inch penetration Asphalt macadam base course
D. 2 - 4 inch water bound macadam base courses
E. 9 inch selected gravel subbase
New DEEP STRENGTH Asphalt section extends northeast paralleling existing U. S. Route No. 42
Columbus

For strength and durability 7½ inches of Asphalt surface and base are laid on 12 inches of compacted aggregate.

New Section of Interstate 71:

First DEEP STRENGTH Asphalt Paved Interstate Highway in Ohio!

Traffic is now rolling on the first DEEP STRENGTH Asphalt paved Interstate Highway in Ohio. Serving a highly industrialized area, this new 17-mile section of Interstate 71 will be subjected to heavy freight traffic.

That's one reason why Ohio State highway engineers chose DEEP STRENGTH Asphalt pavement. Notice in the cross-section drawing (below) how design follows precepts of DEEP STRENGTH Asphalt construction . . . heavy-duty Asphalt concrete surface course . . . heavy-duty Asphalt base . . . Asphalt primed subbase . . . **depressed median and deep longitudinal drain on outside and inside shoulders for good drainage** . . . heavy proof-rolling of subbase . . . and use of high-contact pressure pneumatic proof-roller on all other courses. HERE IS STRENGTH AND DURABILITY!

When built like this—for DEEP STRENGTH—Asphalt pavements will carry heaviest traffic loads without distress . . . and with minimum maintenance cost.

And, most important, Asphalt pavements built to this Advanced Design Criteria can often save money over the cost of Asphalt pavement designed to other standards. That's because the Advanced Design Criteria permit inexpensive Asphalt base to be substituted, within limits, for more expensive Asphalt concrete surfacing, and allow reduction in total structure thickness when used in place of untreated base.

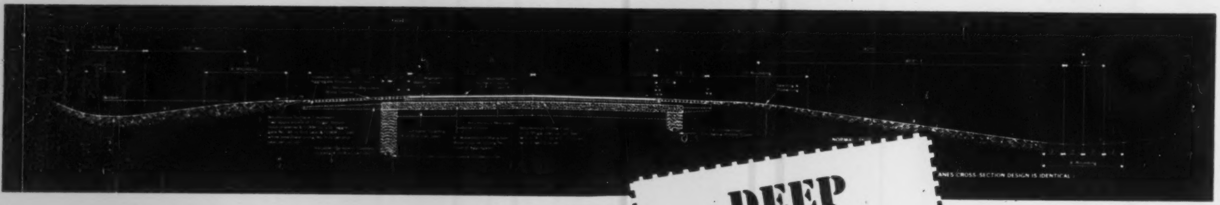
NEW HANDBOOK! A new edition of the *Asphalt Handbook* incorporating all the Advanced Design Criteria implied by the term DEEP STRENGTH Asphalt pavement is now available. Write to The Asphalt Institute.

For smoother riding, the subbase was proof rolled with a 50-ton compactor using tire pressures of 150 psi. A 30-ton rubber tire compactor with tire pressures of 120 psi was used on all other courses.

For good drainage, section was designed with a depressed median and a system of deep longitudinal drains on each side of travel lanes to prevent water from entering the foundation courses.

THE ASPHALT INSTITUTE

Asphalt Institute Building, College Park, Maryland


ANES CROSS-SECTION DESIGN IS IDENTICAL

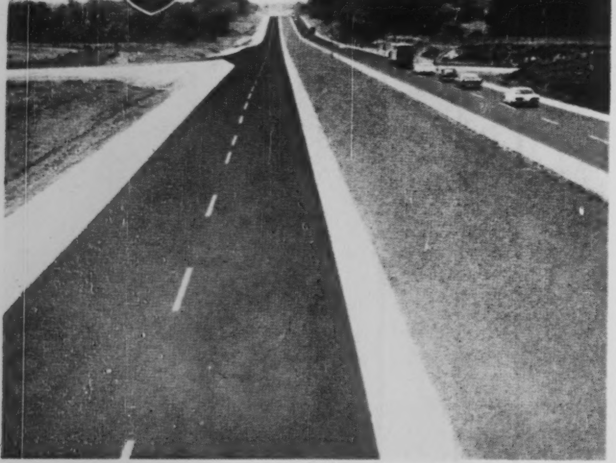
DEEP STRENGTH

INTERSTATE
NORTH CAROLINA
85

North Carolina Highway Engineers

SOLVE TROUBLESOME SOIL AND DRAINAGE PROBLEM

Build North Carolina Interstate 85 with new DEEP STRENGTH Asphalt pavement



STAGE CONSTRUCTION IN WIDTH—This new section of N. Carolina's Interstate 85 is a good example of *stage construction in width*. Two new lanes (left), built with DEEP STRENGTH Asphalt pavement, have been constructed alongside existing two lanes of Route 70 (right) to form a new section of this Interstate Highway. This combination of DEEP STRENGTH Asphalt pavement and *stage construction* is helping states to stretch construction dollars and still provide necessary highways quickly.

For new Guilford County section of Interstate No. 85, North Carolina Highway Engineers have chosen DEEP STRENGTH Asphalt pavement.

In Guilford County, engineers faced a difficult problem. The native soil in this area contains extensive strata of silty clay with high moisture content which could weaken the support of a finished road. To eliminate this threat to Interstate 85, the foundation was carefully proof-rolled with a 50-ton pneumatic tire roller to locate weak areas. These areas were then strengthened by replacing silty clay with suitable materials or installing necessary sub-drainage. It was only after this painstaking effort that actual construction of the pavement structure was begun.

In building this new part of Interstate 85, N. Carolina engineers followed several precepts of DEEP STRENGTH Asphalt pavement design. Notice in pictures and cross-section (below) the use of **6 inches of Asphalt base under 2 inches of Asphalt concrete surface course . . . Asphalt surface treated outside shoulder . . . depressed median for good drainage . . . heavy proof-rolling of the subgrade . . . and use of high-contact pressure pneumatic tire proof-roller on the aggregate base course.** Here is strength and durability!

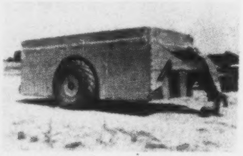
When designed like this—for DEEP STRENGTH—Asphalt pavements *will carry the heaviest traffic loads without distress and with minimum maintenance*. Also, use of Asphalt pavement avoids high repair costs due to damaging action of de-icing salts experienced on other pavement type.

BEST USE OF ROAD FUNDS

State after state is finding that when Interstate Highways are built with Advanced Design DEEP STRENGTH Asphalt pavements, the optimum use is made of road building funds. That's because the Advanced Design Criteria permit inexpensive Asphalt base to be substituted, within limits, for more expensive Asphalt concrete surfacing. In addition, when Asphalt treated base is used in place of untreated base, reduction in total structure thickness may be allowed.

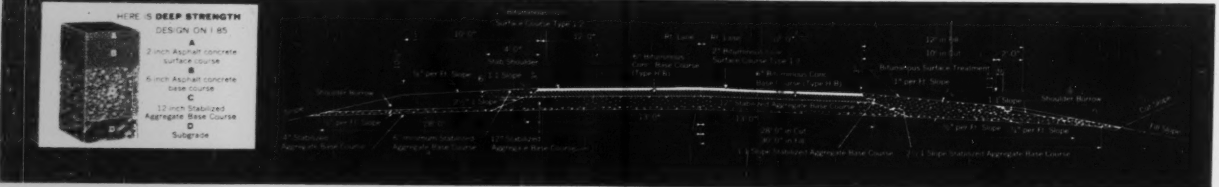
THE ASPHALT INSTITUTE

Asphalt Institute Building, College Park, Maryland



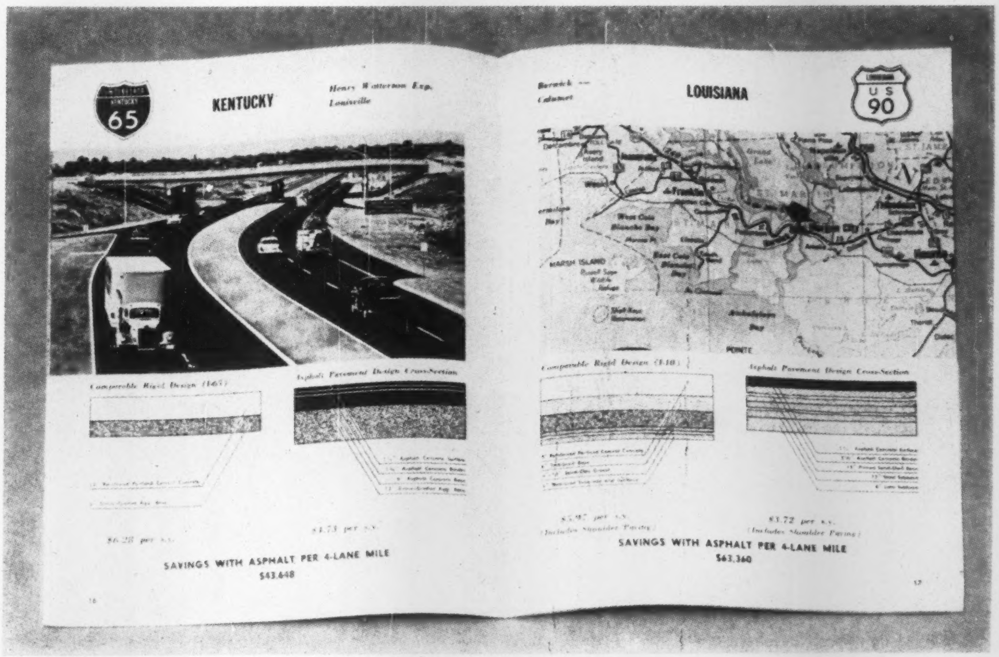
Heavy compaction—This 50-ton rubber tire roller was used to proof-roll the subgrade. The aggregate base was proof-rolled with a 25-ton pneumatic tire roller exerting 82 psi contact pressure.

Outside Shoulders of stabilized aggregate base were Asphalt surface treated for width of 10 ft. One-half inch granite stone chips provide better traffic lane demarcation.


HERE IS DEEP STRENGTH DESIGN ON I 85
A
2 inch Asphalt concrete surface course
B
6 inch Asphalt concrete base course
C
12 inch Stabilized Aggregate Base Course
D
Subgrade
Surface Course Type I-2
10'-0"
12'-0"
4'-0"
Stab. Shoulder
Rt. Lane
Rt. Lane
6" Bituminous Conc. Base Course (Type H-B)
2" Bituminous Conc. Surface Course Type I-2
6" Bituminous Conc. Base Course (Type H-B)
12" in Fill
10" in Cut
Bituminous Surface Treatment
1" per Ft. Slope
Shoulder Borrow
1:1 Slope

WHAT ARE THE REAL FACTS ABOUT COMPARATIVE PAVEMENT COSTS?

This 48-page illustrated Cost Reference Guide gives you the facts—not fiction—about "COMPARATIVE PAVEMENT COSTS on Inter-state—Defense and Primary Roads."



KENTUCKY

Henry Watterson Exp.
Louisville

$6.28 per s.y.

$4.73 per s.y.

SAVINGS WITH ASPHALT PER 4-LANE MILE
$43,648

16

Berwick —
Calumet

LOUISIANA

$5.97 per s.y.
(Includes Shoulder Paving)

$3.72 per s.y.
(Includes Shoulder Paving)

SAVINGS WITH ASPHALT PER 4-LANE MILE
$63,360

17

HERE ARE THE FACTS YOU NEED to compare costs of roadway design. This 48-page guide diagrams design features of 44 different highways. Here are the comparative costs per mile and comparative costs per square yard. Here are the ways savings are made. To get better roads for every tax dollar, here are the facts you need. Mail the coupon today for your free copy of "COMPARATIVE PAVEMENT COSTS."

The Asphalt Institute, College Park, Maryland

Gentlemen: Please send my complimentary copy of "COMPARATIVE PAVEMENT COSTS" by return mail.

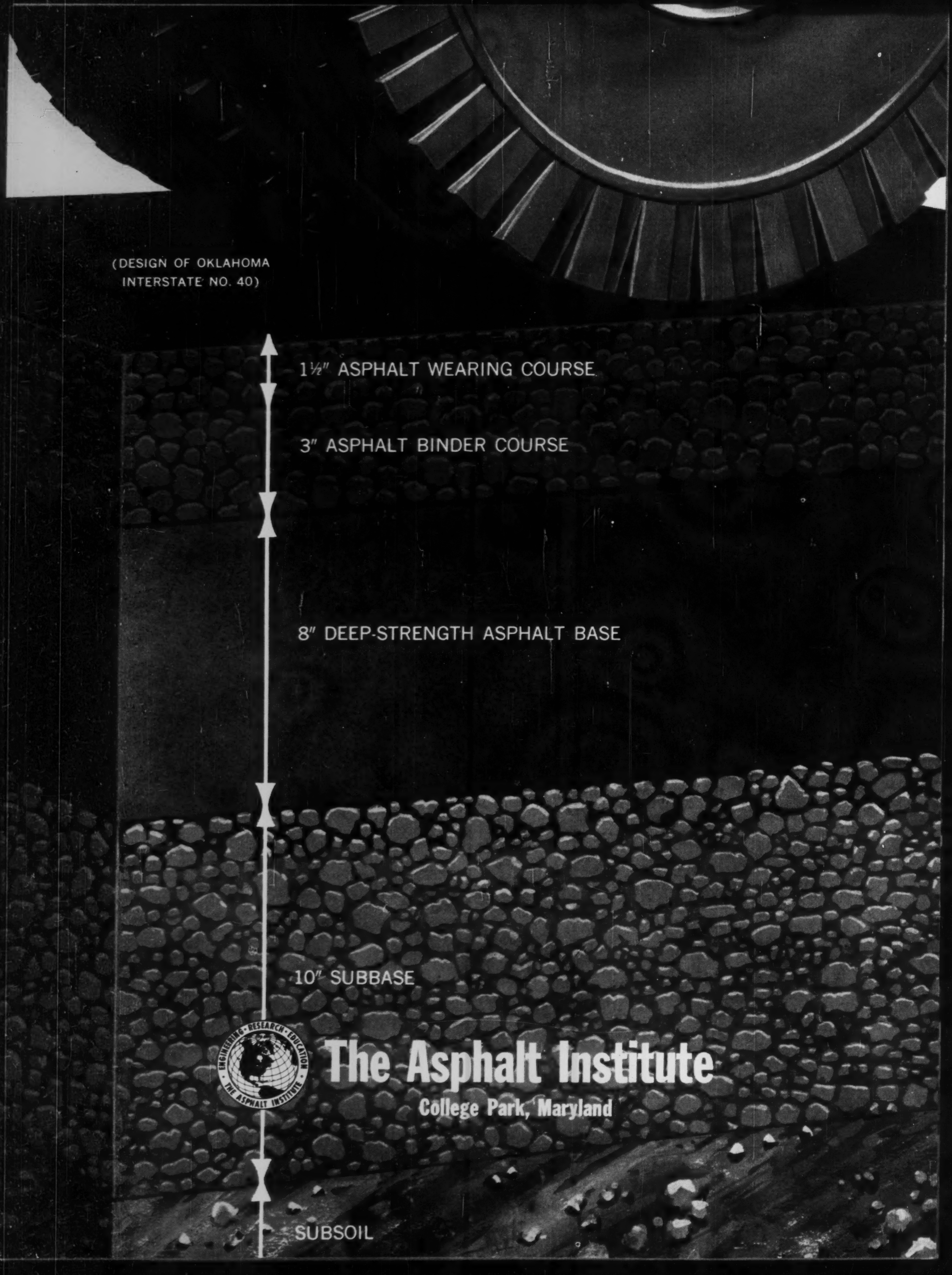
NAME________________________________

ADDRESS______________________________

CITY________________ZONE_____STATE____________

NAME OF FIRM OR ORGANIZATION__________________

YOUR TITLE____________________________


(DESIGN OF OKLAHOMA INTERSTATE NO. 40)
1½″ ASPHALT WEARING COURSE
3″ ASPHALT BINDER COURSE
8″ DEEP-STRENGTH ASPHALT BASE
10″ SUBBASE
SUBSOIL

The Asphalt Institute
College Park, Maryland

Quoddy Ditty

SIR—The letter written by Jacob Feld (ENR May 25, p. 6) in regard to the Passamaquoddy tidal project brings to my mind a ditty that was presented at a Christmas party given by the Quoddy study group.

The ditty names Richard Field, Chief of the Quoddy group working under the Army Engineers, New England Division, and George Makela, one of Field's principal assistants.

Dicky Field, he heard the cry,
And to Mak, he said we'd try
To make good sense of Quoddy's tides,
Including other schemes besides
Will it pay?
Who can say?
And Mak, who has the knack
Of holding the workers on the rack,
Said, "Dick, it'll be some trick
To make Quoddy click."
Don't so truthful be, Mak
You'll get the sack.
So Mak worked hard to make some sense,
Of charts and curves and figures dense;
But hard as he could drive the team,
It all came back to Cooper's scheme.
So Quoddy's plans go round and round;
The perfect scheme has not been found.

HORACE C. CRANDALL
Construction Consultant
Reading, Massachusetts

Dam Decimal Points

SIR—In your article on Yuba River Project (ENR May 25, p. 24), there was one error we would like to point out. The Bullards Bar Reservoir will impound not 93,000 but 930,000 acre-ft of water.

It is also noteworthy that Bullards Bar Reservoir will provide a flood control reservation of 170,000 acre-ft. In the 1955 Yuba City flood this would have represented a river level about two ft below the levee-top flow which occurred at Marysville and Yuba City.

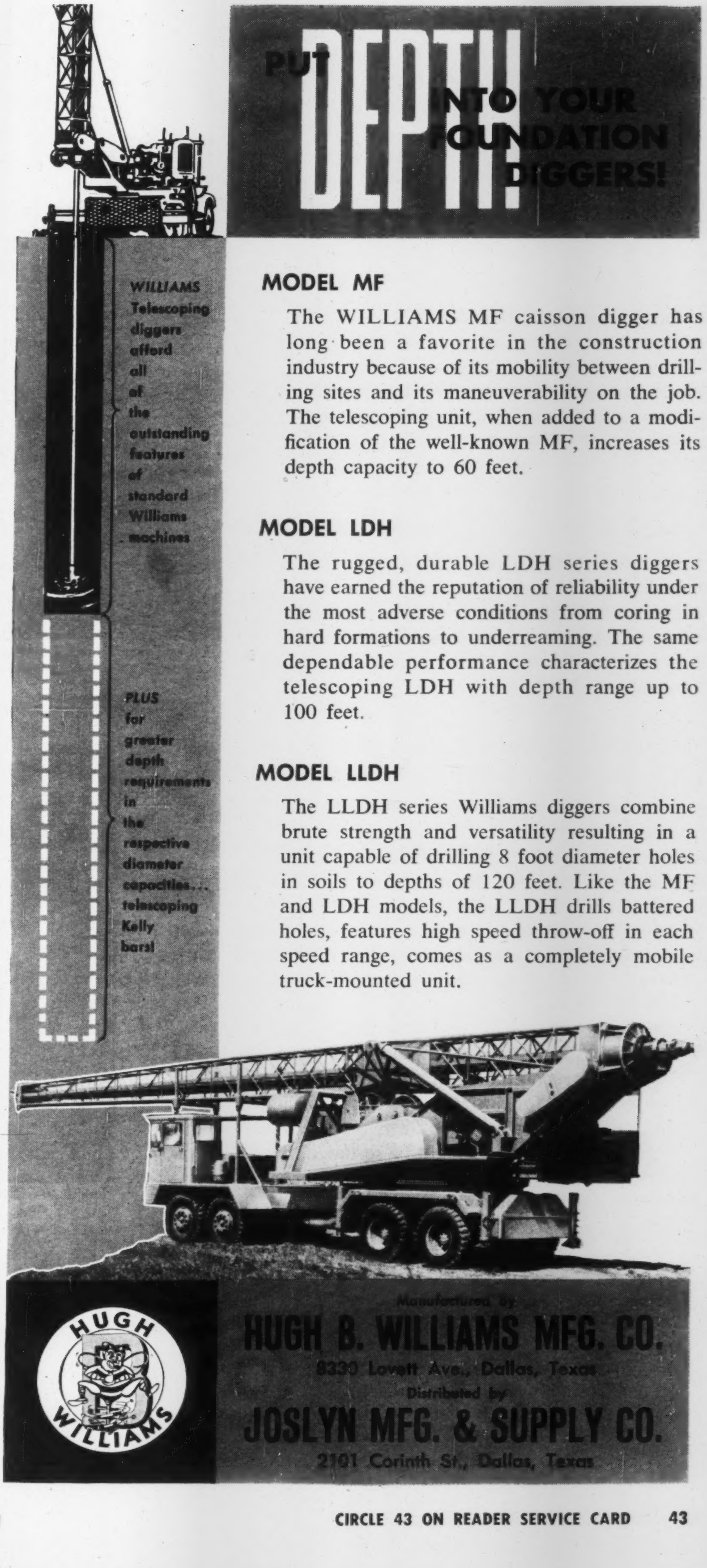
COLIN H. HANDFORTH
Handforth-Dawson
Engineers for Yuba County Water Agency
Marysville, Calif.

For Your Calendar . . .

American Society of Testing Materials, annual meeting, Chalfonte-Haddon Hall, Atlantic City, N. J. June 25-30. Write: ASTM, 1916 Race St., Philadelphia 3, Pa.

Standards Engineers Society, annual meeting, Hotel Sherman, Chicago, Ill., Sept 18-20. Write: Standards Engineers Society, 170 Livingston Ave., New Providence, N. J.

Western Building Industries Exposition, Great Western Exhibit Center, Los Angeles, Calif., Oct. 7-10. Write: A. Byron Perkins & Associates, Inc., 2216 Hill St., Los Angeles, Calif.


PUT DEPTH INTO YOUR FOUNDATION DIGGERS!

WILLIAMS Telescoping diggers afford all of the outstanding features of standard Williams machines

PLUS for greater depth requirements in the respective diameter capacities... telescoping Kelly bars!

MODEL MF

The WILLIAMS MF caisson digger has long been a favorite in the construction industry because of its mobility between drilling sites and its maneuverability on the job. The telescoping unit, when added to a modification of the well-known MF, increases its depth capacity to 60 feet.

MODEL LDH

The rugged, durable LDH series diggers have earned the reputation of reliability under the most adverse conditions from coring in hard formations to underreaming. The same dependable performance characterizes the telescoping LDH with depth range up to 100 feet.

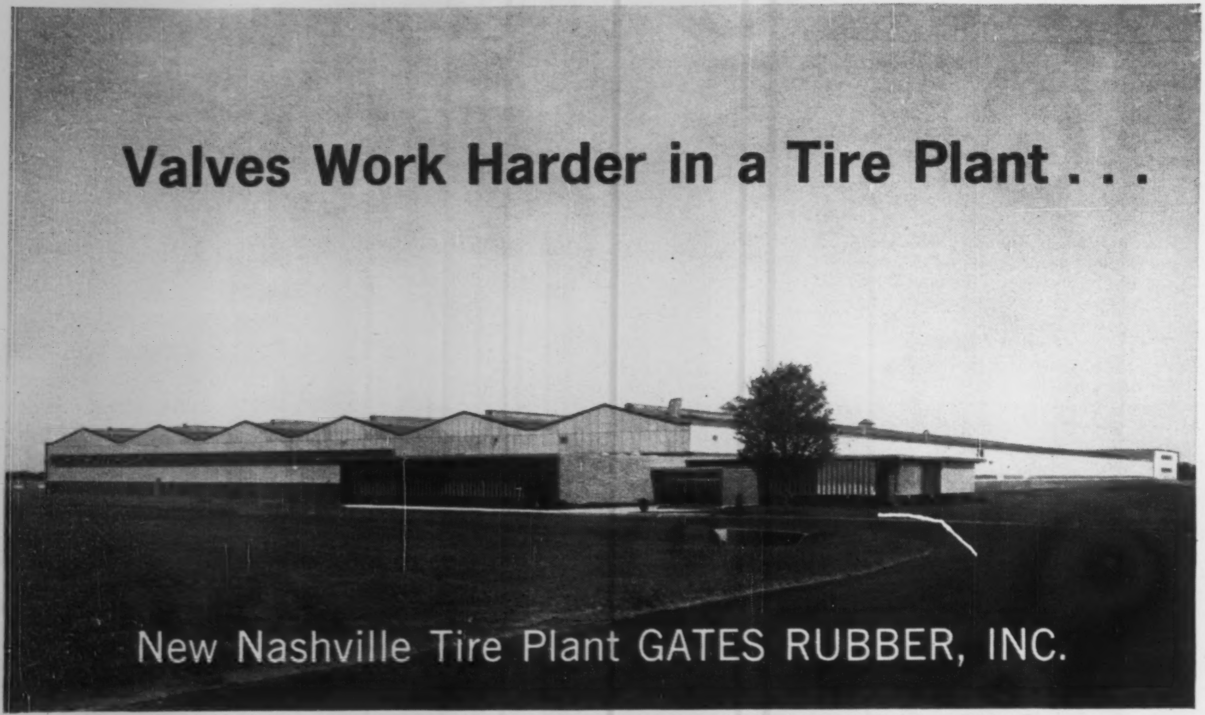
MODEL LLDH

The LLDH series Williams diggers combine brute strength and versatility resulting in a unit capable of drilling 8 foot diameter holes in soils to depths of 120 feet. Like the MF and LDH models, the LLDH drills battered holes, features high speed throw-off in each speed range, comes as a completely mobile truck-mounted unit.

HUGH WILLIAMS

Manufactured by
HUGH B. WILLIAMS MFG. CO.
8330 Lovett Ave., Dallas, Texas
Distributed by
JOSLYN MFG. & SUPPLY CO.
2101 Corinth St., Dallas, Texas

Valves Work Harder in a Tire Plant . . .



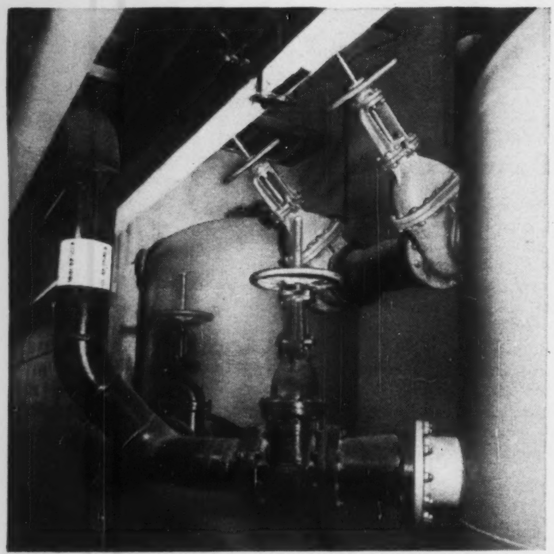
Over 600,000 sq. ft. plant with capacity of two million tires a year. Designed by engineering staff of Gates Rubber Co.
General Contractor: RUST ENGINEERING CO., Birmingham, Ala.

GATES specified the valves that stand hard work, longer ... JENKINS VALVES

Because high pressure steam, compressed air and water play a big part in making auto and truck tires, valves work unusually hard in this new Gates Rubber plant near Nashville, Tenn.

To be sure of valves that would stand such punishing service, Gates Rubber called for Jenkins Valves. And, with 2500 of them controlling processing and service lines, Gates can look forward to substantial savings in valve maintenance and replacement costs.

Your job for valves may not be so tough, but the extra-quality of Jenkins Valves is well worth specifying . . . especially since you pay no more for it. It's true . . . Jenkins Valves not only *cost less* in the long run — they *cost no more* to buy. Jenkins Bros., 100 Park Ave., New York 17.



Jenkins Valves controlling air system at constant pressure of 90 lbs.

JENKINS
MOST TRUSTED TRADEMARK IN THE VALVE WORLD
VALVES
JENKINS® SINCE 1864
Jenkins Bros

Available From Leading Distributors Everywhere

ENGINEERING NEWS-RECORD
Vol. 166, No. 25 June 22, 1961
Number of copies printed in this issue 87,976

CONTENTS

Why They Joined the Peace Corps 49
Beam Takes Turn for the Worse 50
Trenton's New Sewage Treatment Plant 50
CE Educators Vote for Five Years 51
Two Strikes and You're Out 51
Steel Award Winners 52
Column Levers Compress HP Roof 54
Canaveral Announces Largest Launching Complex 55
Sold! To the Man in Seattle 55

FEATURES

Federal-Aid Highways After Five Years 60
New Highways Make a Better U.S. 63
Machines Revolutionize Methods 69
Equipment Is Bigger and Better 72
Materials Improve With Highways 74

2ND QUARTERLY COST REPORT 79

INTERNATIONAL

Machines and Men Push a Long-Sought Rail Link 138
Why Construction Worries the Soviets 143
Steel Design Meets Overpass Limits 151
Soviets Plan 1967 World's Fair 152
Paris Metro to Tie to Railway 152

FIELD AND OFFICE

Hilltop Entrance to Buildings Tied by Bridge 159
Cantilevered Beam Carries Girder 160
Epoxy Bonds Blocks Into House 160

RESEARCH AND DEVELOPMENT

Machine Lays 900 Bricks an Hour 167
Researchers Compare Paving Costs 167
Traffic Test Favors Computer 168
Tractor to Explore Frozen Lakes 168

NEW PRODUCTS

European Tower Cranes Coming to U.S. 170
85-Ft Trailer Rolls on 40 Wheels 175
Aging Yields New Alloy Steels 175
Truck Crane Becomes Track Crane 178
Roto-Mixer Has Hydrostatic Drive 178

MEN AND JOBS

Generals Hanmer, Sibley Get New Corps Positions 187

BUSINESS AND FINANCE

Highways Assured of $9 Billion 301
Texas Speeds Water Resources Development ... 301
Office Start Due 302

LABOR

Missile Commission Starts to Work 307
New Contracts End Two Long Strikes 308
School Bill Stirs Wage Feud 308
Court Holds Burt Boycott Is Illegal 310

Reader Comment ... 10
Calendar 34
Washington Observer 47
Materials Prices 103
Unit Prices 112
Obituaries 190
Books 195
Legal 209
Publications 223
Construction Reports. 257
Statistics, Indexes ... 297
Editorials 322

Picture Credits

Cover—ENR; 50 top—Wide World, bottom—Ben David; 52 top—Pan American World Airways, middle—Rondal Partridge, bottom left—Welton Becket and Assoc.; 53 top—© Baltazar Korab; 54—ENR; 64—Oregon State Highway Dept.; 65—California Div. of Highways; 69—Wide World; 70, 71—Lockwood, Kessler & Bartlett, Inc.; 138, 139, 140—Centro Photo; 152—McGraw-Hill World News; 154—UPI; 160—Francis Di Gennaro.

Back issues of ENGINEERING NEWS-RECORD *are generally available for the previous six months. Semiannual indexes will be sent on request.* ENGINEERING NEWS-RECORD *is also indexed in the Applied Science & Technology Index, Business Periodicals Index and the Engineering Index.*

THE CONSTRUCTION WEEK

HOUSING STARTS RECOVER—Housing starts in May rose to nearly 1.3 million units on a seasonally adjusted annual rate basis. This is the highest rate in 11 months, according to estimates of the U.S. Census Bureau. It's 8% above the April rate. Private starts of 124,000 in May came close to matching the 130,000 starts of one year ago, additional evidence that the housing slide may be ending.

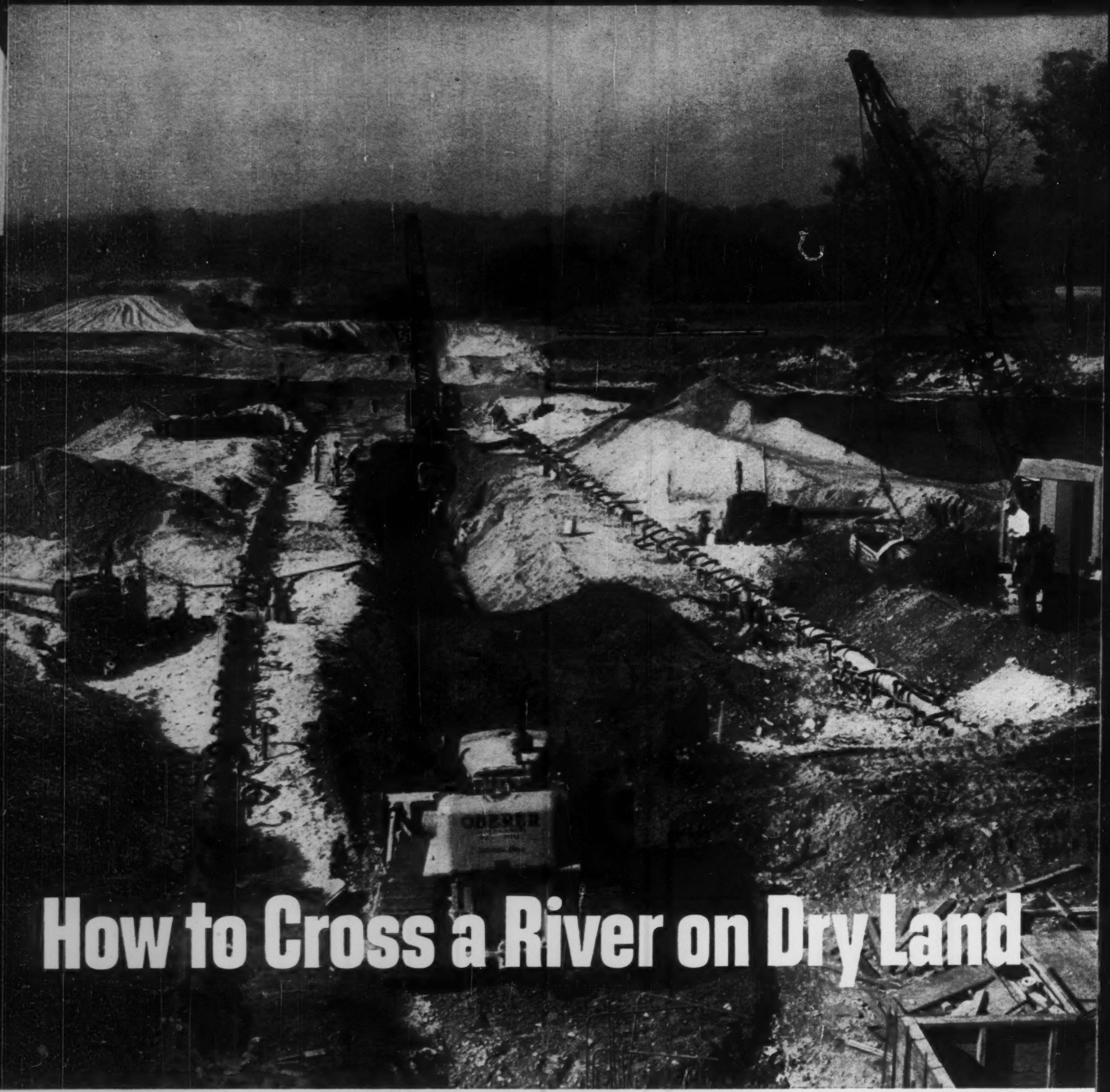
BUILDERS SCORE A BASE HIT—Despite frequent design changes and difficult ground conditions, builders of the Atlas ICBM base at Schilling Air Force Base, Salina, Kan., finished the job two months ahead of schedule. Contractors for the $37.5-million, 12-launcher base are Utah Construction & Mining Co., Salt Lake City; The Manhattan Construction Co., Muskogee, Okla., and The M. M. Sundt Construction Co., Tucson, Ariz.

ONLY NAME WILL CHANGE—Members of the American Society for Testing Materials will vote on a change in the name of the society at the annual meeting in Atlantic City next week. The new name, American Society for Testing and Materials, will retain the famed initials, ASTM. Purpose of the change: to represent more fully the scope of the organization's activities—promotion of knowledge of the materials of engineering and standardization of specifications and methods of testing.

FAST FAILURE—The Blatnik committee's investigations in New Mexico have turned up a four-mile stretch of road that failed so badly that the state spent $55,000 for maintenance during its first 16 months of use, and so quickly that the federal government was able to withdraw its $654,000 share of the costs. Now the government will contribute $355,000 for reconstruction. The failure was blamed on weakness in inspection procedures.

PORTAGE IN THE SPACE AGE—The National Aeronautics and Space Administration will portage its Saturn rocket booster around Wheeler Dam. Collapse of a lock wall three weeks ago stranded the big booster, bound for Cape Canaveral by barge, upstream on the Tennessee River (ENR June 15, p. 22). NASA will barge Saturn down to the dam, haul it overland a mile, and refloat it on the downstream side.

TOBIN GUILTY—The Port of New York Authority last week lost another round of its long-standing fight for power with the U.S. Congress. Authority chief Austin J. Tobin was found guilty by a Federal District Court of contempt of Congress. Mr. Tobin was fined $100 and sentenced to 30 days in jail for refusing to give records to a congressional committee. Sentence was stayed pending an appeal.



GRIFFIN **Solves Another Dewatering Problem!** In just 14 days, the Oberer Construction Company of Dayton laid a 1000-foot sewer siphon — **in the dry** — under the Miami River at Hamilton, Ohio. Water flowing through the coarse sand and gravel riverbed formation was kept under perfect control by a wellpoint system designed and supervised by Griffin. George Oberer, Jr. commented, "This was the best job we ever had. Thanks to the excellent dewatering results, we saved time and excavation."

If you have a dewatering problem, call Griffin—we can save you time and money too.

RENTAL/CONTRACT/SALES **GRIFFIN**

GRIFFIN WELLPOINT CORPORATION • GENERAL OFFICE: 881 E. 141st St., New York 54, N. Y.

Branches: Hammond, Ind. • Jacksonville, Fla. • New York, N. Y. • Houston, Tex.
Redwing, Minn. • W. Palm Beach, Fla. • Norfolk, Va. • Gulfport, Miss.

CIRCLE 46 ON READER SERVICE CARD

WASHINGTON OBSERVER

- **Put public works in the bank?**
- **Rules against job bias coming**
- **Big 'scope still in trouble**

● **A sizable public works program should be kept on tap for use in the early stages of a recession.** That is the feeling of the privately financed Commission on Money and Credit, a group of private citizens that submitted a report to President Kennedy last week. The group, headed by board chairman Frazar B. Wilde of the Connecticut General Life Insurance Co., was financed for its three-year study by the Ford Foundation, the Merrill Foundation and the Committee for Economic Development.

Suitable public works programs should be enacted by Congress for a number of years to permit greater flexibility and timing, says the commission. And "The possibility of advance appropriations for a public works program should be considered." The idea is to get new money into the economic blood stream as quickly as possible. Or, as the commission puts it, "to combat a recession, a high ratio of spending in the early period relative to subsequent periods would be favorable." It also says the federal government should provide incentives for state and local governments to adopt similar public works programs.

—

● **Heavy adverse reaction by contractors has forced a second hearing on anti-discrimination rules proposed by the President's Committee on Equal Employment Opportunity.** The regulations generally would ban job bias on federal contracts of more than $5,000. Considerable opposition was heard—particularly from several South Carolina business groups—at a recent hearing. Another session was scheduled for June 30 at the request of the contractors.

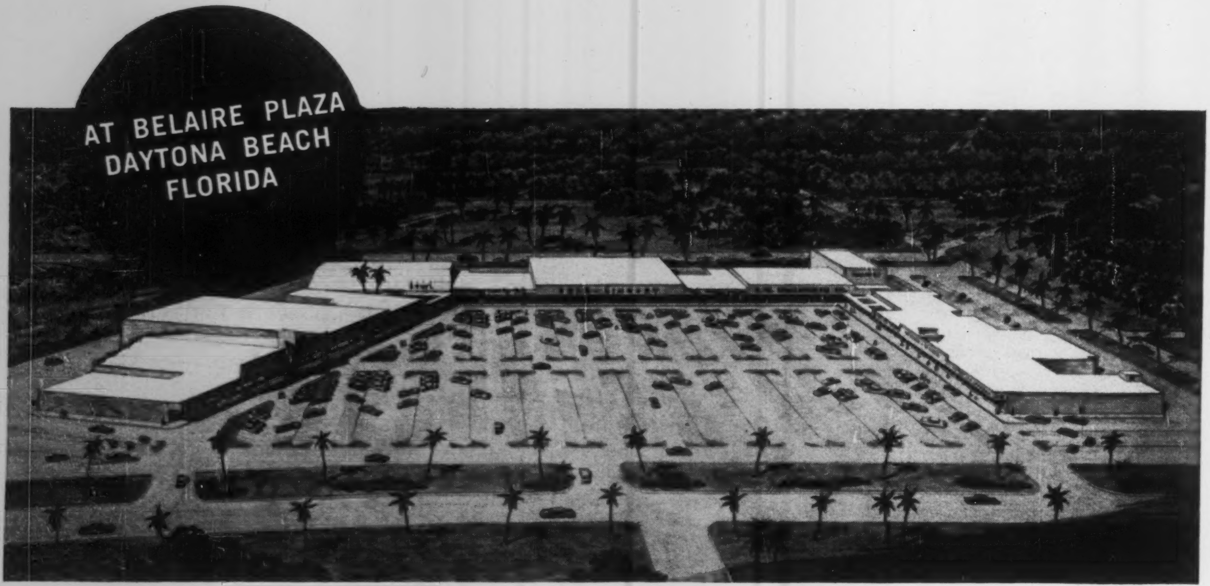
Chances of the regulations becoming official still are excellent. The committee, headed by Vice President Lyndon B. Johnson, is not likely to be deterred by the criticism and opposition. This is especially true in view of the committee's initial success in getting Lockheed to agree to a non-discrimination pact for its plant at Marietta, Ga.

—

● **Construction progress on the Navy's huge radio telescope at Sugar Grove, W. Va., still is stalled.** The situation on the 600-ft-dia installation is so bad that steel workers have been withdrawn from the project. American Bridge Division of U. S. Steel, contractor for the steel work, reportedly may not move its crew back until next spring.

"Design problems have the project tied up in knots." That is the report from more than one source close to the scene. And eight months ago the situation was exactly the same. Design problems had plagued the project so badly that costs pyramided and construction schedules slipped some two years. Last fall, the Navy changed designers and predicted that construction would be stepped up.

But the project continues in the doldrums, with no signs of progress evident in the giant tower. The Navy, understandably sensitive, is giving out little information. One basic problem is that the Navy is attempting to design the structure while construction is in progress. It even is reported that weight problems may force replacement of some of the structure already installed.



400,000 SQUARE FOOT MEARLCRETE INSULATING ROOF DECK

goes up fast...provides many advantages!

LIGHTWEIGHT – Mearlcrete Foam Concrete permits savings in structural steel.

FAST INSTALLATION – Up to 40,000 square feet a day are pumped continuously – up to 250 feet vertical lift . . . 1,000 feet horizontally.

LOW COST – Competitive with all other deck systems.

HIGH INSULATING VALUE – Reduces both initial cost and operating cost of heating and cooling equipment.

FIRE RESISTANT – Rated incombustible, made from Portland cement, Mearlcrete Concrete insulates against heat flow and reduces flame spread.

FAST DRYING – The low mixing water requirement is much less than for other poured decks . . . permits shorter completion schedules.

CONTROLLED QUALITY – Mearlcrete is installed only by trained franchised contractors in accord with established standards.

For the nine acre roof deck at the Belaire Plaza Shopping Center, as in many other installations throughout the country, a Mearlcrete Insulating Roof Deck was specified.

By using mobile, automatic equipment, designed specifically for Mearlcrete application, the roof deck contractors for Belaire Plaza completed the roof deck quickly. With the equipment, the concrete was continuously mixed at ground level and pumped to the deck through flexible hose. Density is precisely controlled and as much as 40,000 square feet of deck could be placed in a single day.

Where a quality roof deck is required, architects, engineers, and contractors throughout the country have learned that Mearlcrete does the job. This 400,000 square foot roof deck is one more example. Your next job, large or small, can benefit from a Mearlcrete Insulating Roof Deck.

The Belaire Shopping Plaza was designed by John J. Harte, Atlanta, Georgia, and built by Jehle Brothers, Inc., Montgomery, Alabama. The roof deck was installed by Hoge-Warren-Zimmermann of Atlanta, Georgia, a franchised Mearlcrete Contractor.

WANT TO LEARN MORE ABOUT MEARLCRETE?
Write for Technical Bulletin R411A today.

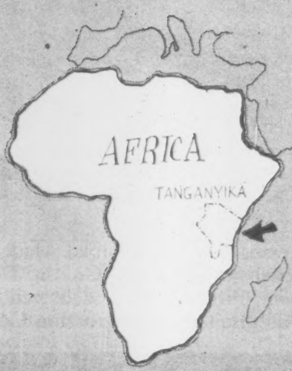
MEARLCRETE

6771

MEARL chemical corporation
220 Westfield Avenue West, Roselle Park, N. J. • CHestnut 5-9500

Why They Joined the Peace Corps

"I'm going to Tanganyika because . . .



. . . of the human element. I'd like them to know we're human beings."

Jacob Feldman
'61 civil engineering graduate
University of Delaware

. . . I decided when I went into engineering that I wanted to do something like this."

Peter De Simone
Bridge draftsman
New York, New Haven & Hartford R.R.

. . . we are our brother's keeper. These people have the desire, all they need is the know-how."

Charles H. Barton
Road surveyor
U.S. Forest Service

Some of them see an opportunity to get a wider range of construction experience than their youth would permit in the U. S.

Some are satisfying their wanderlust.

But the primary motive for the young construction men who this week start training for a Peace Corps roadbuilding project in Tanganyika was summed up best by Charles H. Barton, a road surveyor and a civil engineering major at the University of Michigan.

"We are our brother's keeper," young Barton told ENR.

Barton, who is interrupting his last year of engineering study to join the Peace Corps, explained that he had a first hand view of life in underdeveloped countries while serving on Cyprus with the Army. "These people need and want a better way of life," he said. "They have the desire, all they need is the know-how."

The first Peace Corps mission, to Tanganyika, will comprise 20 surveyors, four civil engineers and four geologists. Their assignment: surveying for farm-to-market roads, assisting in road construction and geological mapping.

The Tanganyika task force will be chosen from a group of 40 young men who start training this week at Texas Western College in El Paso. Their pay: a living allowance that will put them in the same economic bracket as their Tanganyikan co-workers.

Even for the least experienced of the group, this represents a substantial financial sacrifice. Young Barton, for example, had reached the rank of GS4 ($4,040 per year) as instrumentman and crew chief on roadbuilding for the U. S. Forestry Service. When he wins his degree, he could go to GS 6.

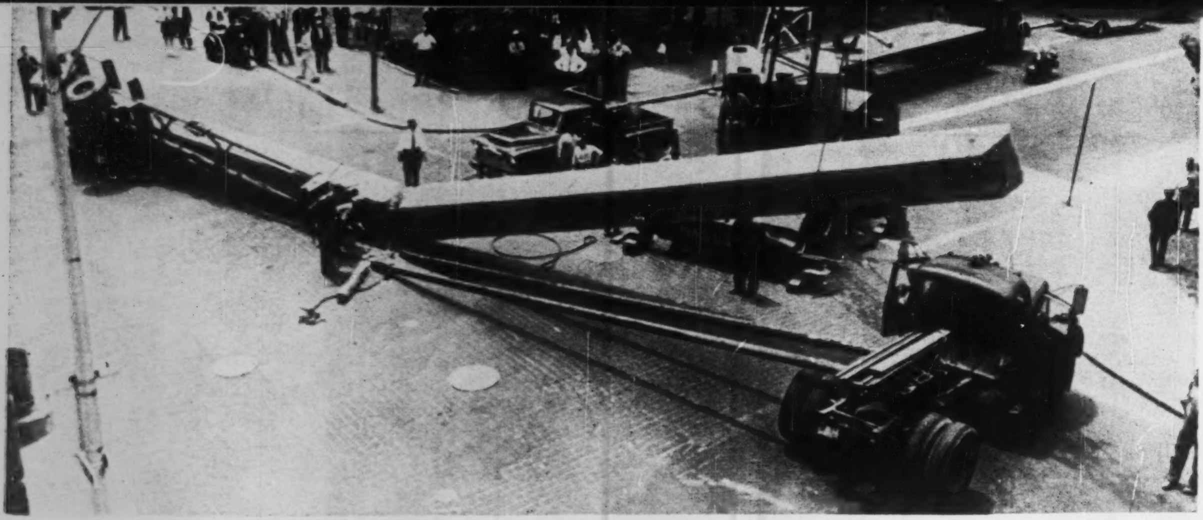
Another Corps trainee, Jeremiah E. Parson, is giving up a $4,300 salary as a technician in the Connecticut Highway Department's Materials Testing Lab. But Mr. Parson, a graduate in construction technology of New York State University, doesn't figure he's giving up anything: "I hope I'll be able to give them as much as they'll give me," he says. Mr. Parson wants to work in private construction as a road designer after the Peace Corps stint.

Another of the group, Jacob Feldman of Wilmington, Del., will be leaving his field of specialty. Although he graduated this June as a structural engineer from the University of Delaware, he'll be doing roadwork if he's picked for Tanganyika. "I'm going because of the human element," he says. "I'd like them to know that we're human beings. Young Feldman is vice-president of the American Society of Civil Engineers' student chapter at Delaware. When the word of his Peace Corps assignment came, he was busy building an experimental geodesic dome, which he helped design at the school.

Also taking a detour is Peter Von Christierson of Sacramento, Calif. Mr. Von Christierson, who has worked for the Spokane, Wash., City Planning Commission and is now studying for a master's degree in city planning from the University of North Carolina, is heading for Tanganyika "because I think it's the right thing to do. I want to understand the people there and let them get to know me." Mr. Von Christierson has a CE degree from the University of Colorado. He has been active in ASCE as co-editor of a newspaper for the Spokane chapter.

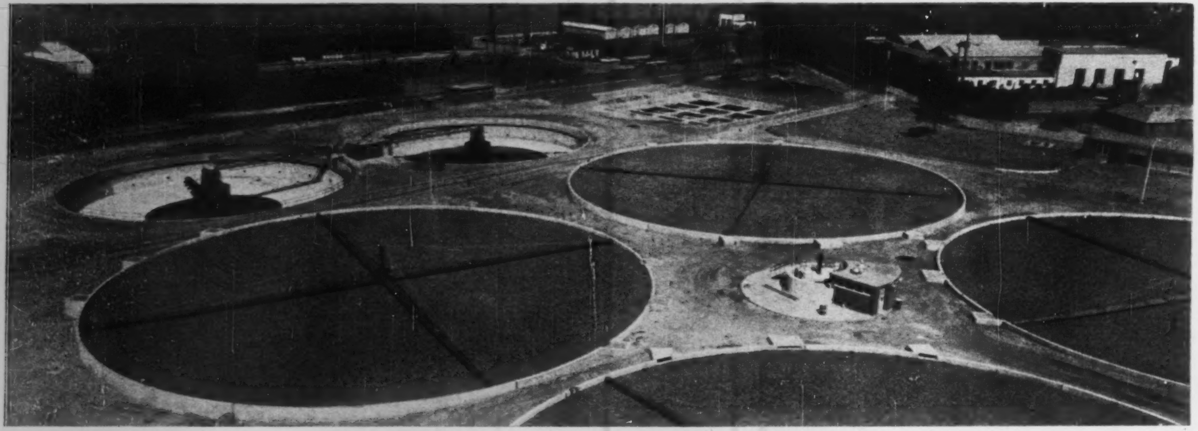
For Peter De Simone, a structural draftsman on bridge construction for the New York, New Haven and Hartford Railroad, the Peace Corps couldn't be better: "I decided when I went into engineering that I wanted to do something like this," he said. Mr. De Simone graduated in engineering a year ago from the University of Connecticut. He has since done some graduate study at Brooklyn Polytechnic Institute.

Other young construction men in this first batch of Peace Corps selectees: Gary P. Gaffner of Seattle, Wash.—Mr. Gaffner has a B. S. in Engineering from the University of Washington and a Masters in Business Administration from Stanford; Don R. Preston of Battle Creek, Mich.—Mr. Preston graduates this year with a B. S. degree from the Michigan College of Mining and Technology, and he has worked as a surveyor; Arthur E. Young of Schwenksville, Pa.—Mr. Young, now a highway engineer for the U. S. Forest Service in Montana, has worked as a highway and bridge designer for Hazelet & Erdel of Louisville and as a building designer for Greeley & Associates of Norristown, Pa.



Beam Takes Turn for the Worse

A 23-ton, 78-ft-long, prestressed concrete beam slipped off its perch going around a corner in downtown Providence, R. I. It overturned the trailer and broke. Made by New England Concrete Co. in Dedham, Mass., it was being delivered to M. A. Gammino Construction Co. of Providence for installation in an overpass in a relocation of U. S. Route 1 at Narragansett, R. I. The beam, one of seven for the overpass, cost $2,000.



Trenton's New Sewage Treatment Plant

The waters of the Delaware River below Trenton, N. J., are cleaner this week than they've been for some time. A spanking new sewage plant last week started treating the capital city's average 17 million gallons a day of domestic and industrial waste.

Engineers began "shakedown" operation of the modern, 20-mgd trickling filter plant early last week while contractors finished up landscaping and road work. The start-up marks an end to the discharge of raw sewage into the Delaware. Sewage had been discharged directly to the river since the old treatment plant, which occupied the same site, was demolished six months ago.

Trenton is the last major city on the Delaware to comply with an area-wide pollution abatement program.

The new plant replaces a 35-year-old Imhoff-type installation, which also had a 20 mgd capacity. A larger plant is not needed because Trenton's 8-sq-mile area is fully developed and has been for many years. Also, the city of 114,000 is surrounded by areas that have their own sewerage systems and plants.

Trenton's real problem was the quantity and quality of its industrial wastes. Roughly 20% of the daily flow is industrial waste, much of which has a high iron content. In fact, this 3 to 4 mgd of industrial waste is the prime reason the city built a plant with trickling filters instead of an activated sludge unit. Engineers say trickling filters are less sensitive to wide variations in the quality of industrial wastes.

Nucleus of the semi-automatic plant is a central pumping station that lifts sewage leaving the grit chambers 23 ft to the primary settling basins. From the settling tanks, flow is distributed to the four 175-ft-dia trickling filters—just about the largest models in use today.

Sewage from the filters goes to secondary settling tanks. Sludge is digested in four reinforced concrete tanks—two primaries, the others secondaries with floating tops. Digested sludge is lagooned in extensive basins that sprawl behind the plant. Effluent is chlorinated and discharged to the river.

Construction was financed out of general taxation, except for a $250,000 federal grant under the 1956 Water Pollution Act. But sewer charges are planned and an enabling ordinance has already been passed.

Bogert and Childs, New York, designed the plant. Charles Simkin & Sons, Inc., Perth Amboy, N. J., built it.

CE Educators Vote for Five Years

A majority of civil engineering educators appears ready to abandon the four-year curriculum.

Don't expect it to come overnight; changes come slowly in education. But now, at least there's a measure of the sentiment favoring an up-grading of civil engineering by requiring a fifth year of study for the first CE degree. The first four years would lead to an undergraduate degree (Bachelor of Engineering); the fifth would lead to a graduate or professional degree (probably Master of Civil Engineering).

A poll of CE educators wound up 52-to-33 in favor of the pre-engineering program to precede a fifth year for the first CE degree.

This poll called for no snap decisions. It came many months after the National Science Foundation had picked up the bill for a conference on civil engineering education at the University of Michigan. The conference was held last July under joint sponsorship of The American Society of Civil Engineers, the American Society for Engineering Education and The Cooper Union (ENR July 7, 1960, p. 21).

Spadework done for that conference had produced a single resolution, which was to be the conference theme and upon which the prime movers of the conference hoped the educators could be moved to vote.

Instead of voting last July, the educators came up with nine more resolutions (ENR July 14, 1960, p. 32), and it took months to print, circulate, study and vote on them. Only now have the results come forth from ASCE's Committee on Education.

The main resolution (see box) was accompanied by a shorter one—also passed—that said simply: "The time has come to increase the length . . . from four to five years."

In other resolutions the majority voted:

- For abandoning the Civil Engineer degree as a non-academic honor.
- For establishing graduate professional programs leading to a Doctor of Engineering degree while continuing the current university graduate schools offering the Doctor or Philosophy in engineering specialties.
- Against the three-year, pre-engineering programs in colleges of arts and sciences.

Now it's up to the ASCE, plus Engineers' Council for Professional Development and Engineers Joint Council, to support or turn down the major resolution that has been voted by the educators.

Whatever the professional groups do, they should not be expected to dictate changes to the educators. What change comes will come slowly. In the wording of at least one of their resolutions, "That each school continue to respond to the needs . . . on a school by school basis," there was a clear vote for academic freedom—freedom to change or to resist change.

Resolution Favoring Fifth Year

That this conference favors the growth in universities and colleges of a pre-engineering, undergraduate, degree-eligible program for all engineers, emphasizing humanistic-social studies, mathematics, basic and engineering sciences with at least three-quarters of the program interchangeable among the various engineering curricula; to be followed by a professional or graduate civil engineering curriculum based on the pre-engineering program and leading to the first engineering degree, with a Civil Engineering degree awarded only at the completion of the professional or graduate curriculum . . . that increasing opportunities should be provided for qualified students, by progressively more advanced study and research, to earn graduate degrees at the Master's and Doctor's level, and . . . that engineering societies in ECPD and EJC be advised of this resolution and be urged to support it by concurrent resolutions in order that unified action will be taken to secure a truly professional educational base for professional engineering practice.

Two Strikes and You're Out

Two strikes—one by lightning and the other by eight employees of a privately owned utility has led city officials of Glen Cove, N. Y., to seize the water company.

Lightning had damaged one of four pumping stations in the utility's system and, with personnel on strike, the station went unrepaired for a week. The disabled station reduced the system's capacity by about 2 million gallons a day (mgd). Normal peak capacity is between 10 and 11 mgd.

City officials seized the plant on the grounds that the striking coincidence would leave 21,000 citizens with an inadequate water supply in case of fire or a main break.

In the week after the seizure, city crews were repairing the damaged station, and the city planned to return the utility to its owners—New York Water Service Division of the Utilities and Industries Corp.

But the dispute between the water company and members of Local 355 of the Utility Workers Union has been stalemated. The union wants a new contract. The utility refuses to negotiate until the Public Service Commission permits them to raise water rates.

A member of the State Mediation Board has entered the dispute with the intention of settling the strike. The Public Service Commission will soon begin hearings on the rate change.

City officials, however, will oppose the rate hike as a hardship to taxpayers. Moreover, they claim that the water system is inadequate. They had, in fact, instituted proceedings to condemn the water company long before the seizure; but the case has been pending before the State Water Services Commission. The commission is expected to hold a hearing this week to test the validity of the city's claims.

Completing the proverbially vicious cycle, the water company maintains that it can't improve the system without the additional revenue from higher rates.

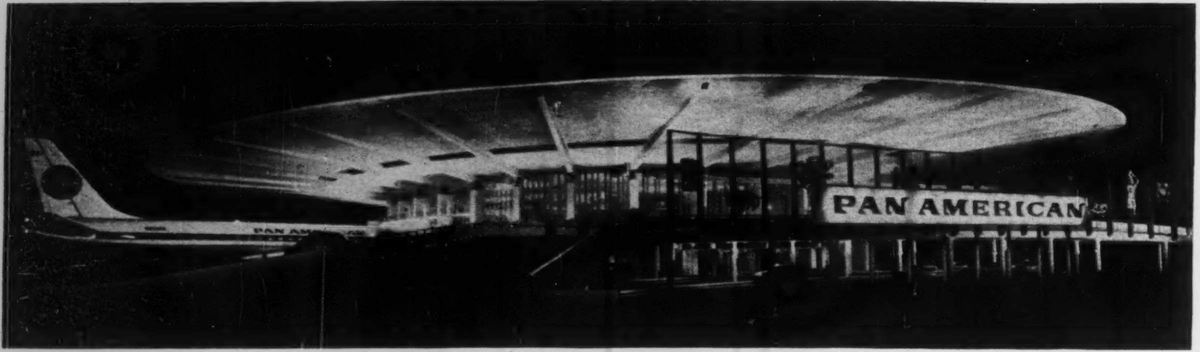
Lightweight Brick and Tile Will Soon Be Available

New lightweight, ceramic masonry units, developed through the Structural Clay Products Research Foundation, will soon be in commercial production.

Selas Corp. of America will build a $300,000 plant for Mapleton Development Corp., Inc., Minerva, Ohio, to produce lightweight clay aggregate, called "SCR veri-lite." The plant should begin producing 4,000 lb of aggregate per hour late this year.

Structural glazed facing tile with one-third "SCR veri-lite" weighs 18% less than units made from ordinary clay, according to Robert B. Taylor, director of SCPRF. It also has lower drying and firing shrinkage, says Mr. Taylor.

Advantages claimed for the lightweight ceramic units include lower shipping costs, easier handling on the job, easier sawing and reduction of building dead load.



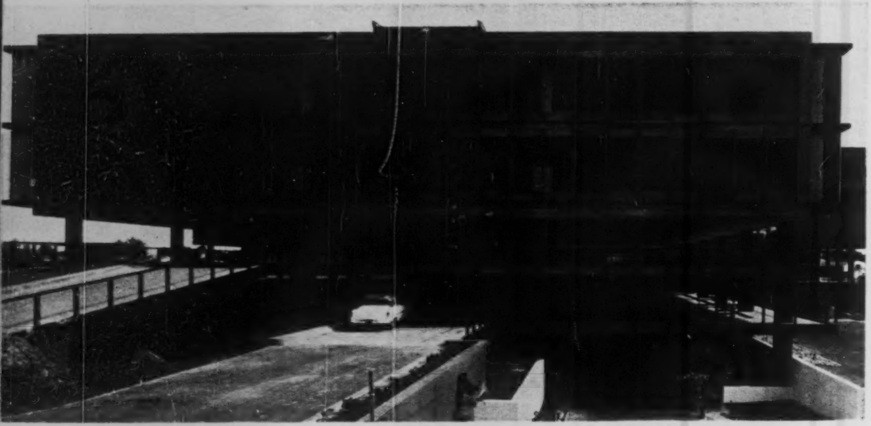
"IMAGINATIVE CONCEPT"—Pan American World Airways terminal at New York International Airport, an elliptical umbrella ribbed with cable-supported steel girders, brought Tippetts-Abbett-McCarthy-Stratton an award for architectural excellence.

Steel Award

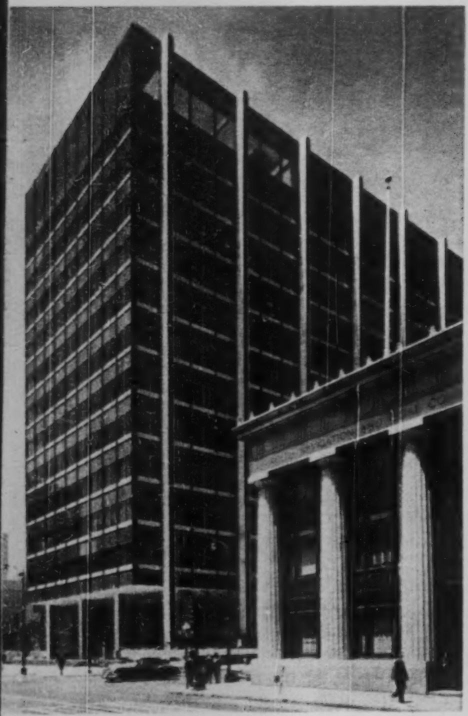
The American Institute of Steel Construction will issue Architectural Awards of Excellence to the architects of nine steel-framed buildings. A jury of architects selected the winners from 61 entries.

Seven of the nine winning designs feature exposed steel frames. The jury praised the "light, airy quality which structural steel permits."

A member of the jury, Olindo Grossi, dean of the Pratt Institute School of Architecture, Brooklyn, N. Y., says, "We are impressed by the wide variety



"MASSIVELY SIMPLE FACADE"—Sacramento Municipal Utility District offices gain flexibility from 60-ft spans. Dreyfuss & Blackford were the architects.



"BAYS CLEARLY DEFINED"—Bethlehem Steel's San Francisco offices won for Welton Becket & Associates.

"POETIC ANSWER"—Faculty Club, U. of Washington, marries site, structure, function. P. H. Kirk, V. Steinbruck, architects.

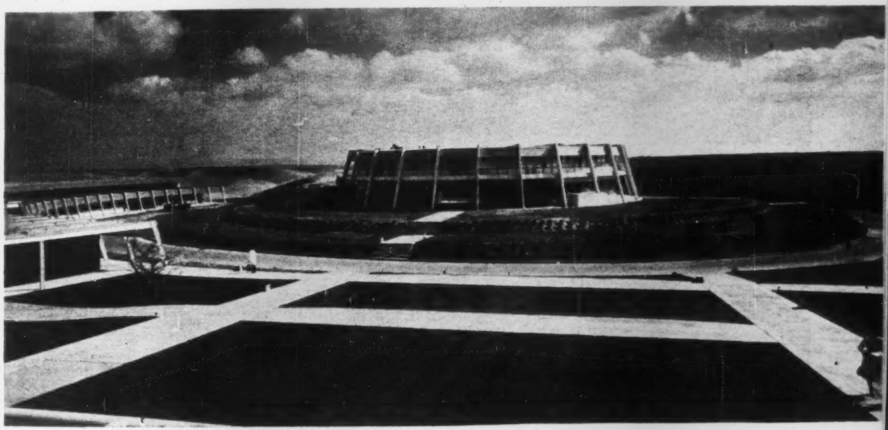
"LIGHT, CLEVER, WARM"—House with uncluttered areas and vistas won for Howard Barnstone, Houston architect.

"EXCELLENT ORGANIZATION OF PLAN" – Community and recreational structures with exposed rigid frames are separated from academic in Southwestern Community Technical High School, Flint, Mich. Eberle M. Smith Associates designed it.

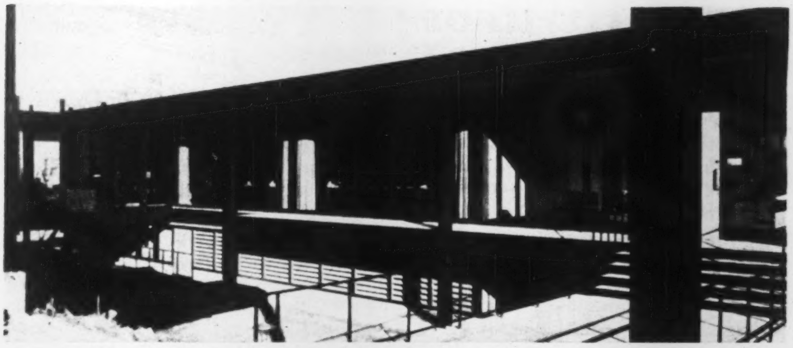
Winners

of building types submitted, and we believe that architects are becoming more adept in using steel to its best advantage. We especially noted the grace and lightness that emphasized the use of steel without excess."

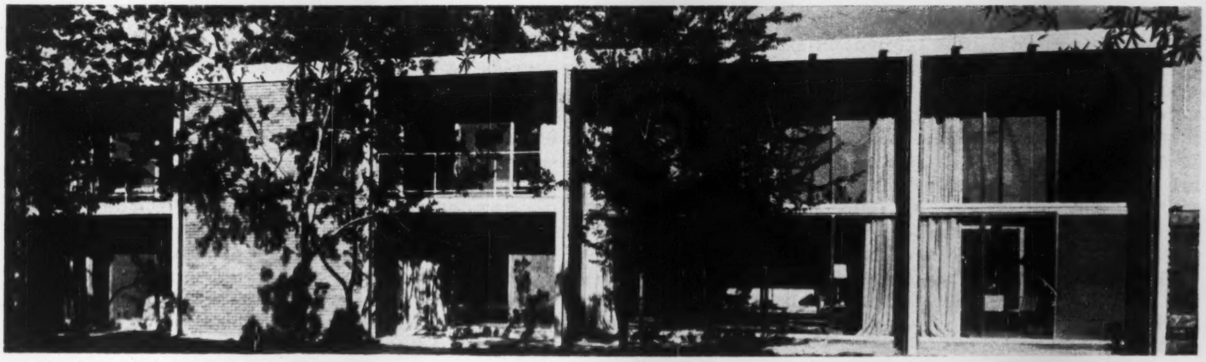
Other members of the jury are Thomas H. Creighton, editor, PROGRESSIVE ARCHITECTURE; Arthur Drexler, director, Department of Architecture and Design, Museum of Modern Art; and Morris Ketchum, Jr., partner, Ketchum and Sharp, New York City architects.



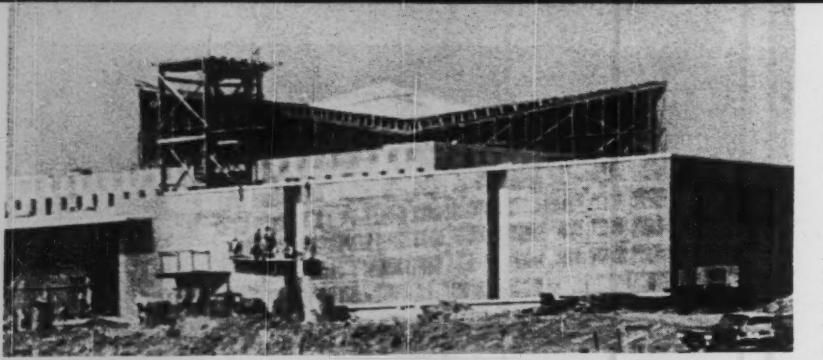
"ROMANTIC AND JAZZY"– John Jay Hopkins Laboratory near San Diego brought an award to Charles Luckman Associates.



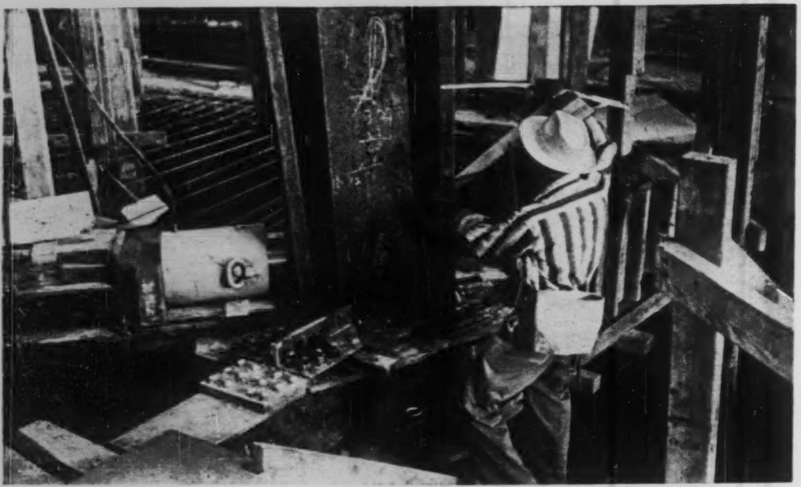
"ORGANIZED CONTINUITY"– First Federal Savings & Loan Association, Denver, won for W. C. Muchow Associates.



"PIECE OF SCULPTURE"–Another Houston house gave a second award to architect Howard Barnstone. Said the jury: "This type of esthetic . . . will increase in usage because of steel's ability to afford open, uncluttered areas and vistas." The house has a simple steel frame, painted white and left exposed outside. Downspouts, ducts, grilles, conduit are fitted in unobtrusively.



HP roof on four steel columns rises above library's main roof.



Hydraulic jack (left) forces column outward to prestress the roof.

Column Levers Compress HP Roof

The complex prestressing operation on the hyperbolic-paraboloid roof of the National Library of Medicine at Bethesda, Md., followed the engineers' script perfectly. Closely supervised by the engineers, four 200-ton hydraulic jacks forced out the bottoms of four lever columns compressing the concrete shell and lifting it off the forms.

The structural engineers designed the 98-ft-square roof for prestressing to relieve dead-load bending stresses in the 3-in. shell (ENR Apr. 27, p. 24). In fact, the prestress on the roof shell anticipates and balances the calculated thrust of the roof on the columns following form removal.

The four steel columns are located at midpoints (low points) of the sides of the square roof. Shallow tapered ribs span the roof between columns, intersecting at the roof's high-point center and dividing the roof plan into quadrants. Wide ribs, extending upward along the roof edges in both directions form double cantilevers joined at the roof corners.

• **Prestressing preparations**—The contractor removed the shoring from the ribs before concreting the shell. The purpose: to permit the ribs to assume their dead-load deflection, reducing shell stresses that would be induced by full deflection later. The general contractor reshored the ribs during shell concreting, and the entire roof remained shored during the prestressing operation.

Each three-story column had a slip joint at the mezzanine floor, one story above the column bottom. A hinged connection at the mezzanine roof, 14 ft above the mezzanine floor, formed a fulcrum. Thus, the prestressing force at the column top, about 7 ft above the fulcrum, nearly doubled the 430-kip jacking thrust. It transmitted about 800 kips into the interior ribs through heavy steel shoes stiffened with welded plates and reinforced with No. 11 welded bars.

A short temporary beam at each column provided the reaction for the jacking force. It framed between the slip joint base plate and a mezzanine floorbeam spanning diagonally between steel compression members. The steel floorbeam provided a vertical reaction to balance the bending moment from the eccentrically applied jacking force.

Preliminary testing of the slip joint the day before actual prestressing produced the only visible ripple in an otherwise smooth operation. One column base stuck after the jack had moved it about $\frac{3}{16}$ in. The jack had to be pumped to 250 tons to break the bond of the graphited slip joint between base plate and cap plate.

• **Two-stage jacking**—The four jacks, operating in unison, prestressed the shell in two stages, moving the column bases $\frac{3}{4}$ in. at the slip joints. During the first stage, when each column base was moved $\frac{7}{16}$ in., the columns pivoted on the webs of the girders in the mezzanine roof tension ring. During the second stage, the jacks moved the bases out the final $\frac{5}{16}$ in.

To make the connections between the column and the tension members act as hinged joints during the first-stage jacking, the engineers specified connections to the column through the webs only. This made them torsionally flexible and thus free to pivot. Steelworkers made the flange connections with high-strength bolts after completion of the first-stage prestressing, when the increasing jacking force required greater joint strength.

Before second-stage jacking, the contractor also released the forms by loosening the screw-jack shores and wedges. The jacks then easily shoved the column bases outward the final $\frac{5}{16}$ in.

To assure stability at the slip joint during welding, steelworkers drove steel wedges between the base plate and the top flange plates of the mezzanine floor compression members until the jack gages registered zero. Then welders applied $\frac{3}{4}$-in. continuous fillets around the base plates.

• **Deflection check**—After completion of the prestressing and final welding of the slip joints, the engineers found that the cantilevered rib deflections at the roof corners varied only $\frac{1}{2}$ in., or less than 10%, from the computed total 6-in. deflection. An additional $\frac{3}{4}$-in. downward deflection occurred after the shores had been removed following the prestressing operation. Corner deflections measured $5\frac{3}{4}$ in. under rib dead load only, resulting in a total deflection of $6\frac{1}{2}$ in.

The shell roof rises above the mezzanine roof of the sprawling structure. The $7.5-million building extends two stories above grade and three stories below. Completion is scheduled early in 1962.

Kenmar Steel Construction Co. performed the jacking operation for the steel subcontractor, Fabricators Steel Corp. of Blandensburg, Md. Arthur Venneri Co., Washington, D. C., is the general contractor; R. B. O'Connor and W. H. Kilham, Jr., New York City, are the architects. Hanns Karl Bandel, an associate with the engineers, Severud-Elstad-Krueger Associates, of New York City, supervised the prestressing operation.

A Nest for Saturn

Cape Canaveral announces largest launching complex

As part of the U. S. race with Russia to the Moon, the Corps of Engineers will call for bids early next month for construction of Cape Canaveral's largest rocket launching complex.

The new installation, Saturn Complex 37, will include two launching pads, a single set of support facilities for both pads, and a service tower that will be the largest structure on wheels. Construction will cost $18 million to $20 million.

The service tower, a 360-ft-high, self-propelled steel structure, will differ from the other service towers that punctuate the Cape Canaveral skyline in that it will serve two launching pads.

Instead of straddling rockets as the other towers do, the Saturn Complex 37 tower will stand next to a rocket. Then, six service platforms will swing out like embracing arms to enclose it. When the rocket is ready for firing, the tower will move away on its rails to avoid the tremendous heat generated by the take-off.

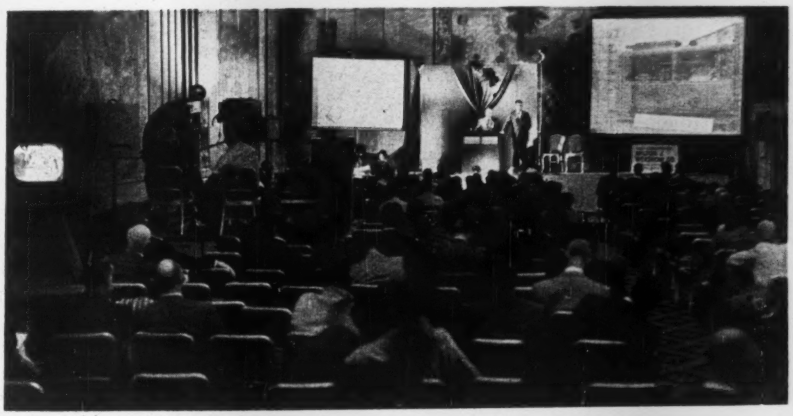
The National Aeronautics and Space Administration will use the two pads at Complex 37 for test firings of rocket boosters for the Saturn space vehicle. The 500-ton Saturn booster will develop 1.5 million lb of thrust (the thrust of the Atlas ICBM is 360,000 lb). When it is perfected, the Saturn will carry an astronaut on a trip around the Moon and back to Earth.

In addition to the launching pads and the service tower, Saturn Complex 37 will include fuel storage buildings, a launch control building and an operations support building.

The Jacksonville District of the Corps of Engineers will let a contract for Complex 37 in early August. Because of the urgency of the space race, construction time has been cut to 13 months, some six to nine months less time than had been originally allowed.

Maurice H. Connell & Associates, Inc., of Miami designed the mobile service tower for Saturn Complex 37. The same firm designed a 310-ft service tower for Complex 34, another Saturn testing facility (ENR Jan. 19, p. 21). Reynolds, Smith & Hills of Jacksonville are associated with Connell & Associates in the Complex 37 project.

Early this month the Corps of Engineers officially turned over Complex 34 to the National Aeronautics and Space Administration. NASA will begin test firings from the $11-million installation later this year. The space group will devote five or six years to preliminary firings before trying to send a man to the moon.



Sold! To the Man in Seattle

". . . $5000 . . . how about $5-500? . . ."

So rang the voice of Milton J. Wershow, auctioneer for a highly successful closed-circuit television auction of government surplus equipment in San Francisco, Los Angeles and Seattle recently.

More than $10 million worth of equipment (purchase price), ranging from mosquito netting to railroad locomotives, went on the block. By the end of the first day, approximately $700,000 had been returned to the government till, and the final total was estimated at $2 million, a 20% return. This is considerably higher than the "less than 15%" expected under ordinary circumstances.

Nearly 1,500 registered bidders were present at the three locations: 600 at Los Angeles' Ambassador Hotel, 450 each at San Francisco's St. Francis and Seattle's Olympic Hotel. The total included representatives from every state in the U. S. and four foreign countries.

This was the second closed-circuit TV auction to be held by the government. The first was held in six locations on the East Coast (ENR Oct. 15, 1959, p. 25), and its success was termed "phenomenal.'"

Some of the high bids received at last week's auction included:

Crane, crawler, 1½ cu yd capacity. Government cost $39,000, sold to a Los Angeles bidder for $22,500.

Crane railroad locomotive, capacity main hoist 13 tons at 25 ft radius. Government cost, $28,787. Three cranes bid separately ranging from $12,000 to $13,500.

Material for sale was on display at 19 different locations in the three Pacific Coast states. During the auction, colored slides of each piece of equipment were displayed in the three bidding halls.

The mechanics of televising the auction were carried out by Television Communications Inc., San Francisco, and cost about $30,000.

The sale was planned and administered by the Consolidated Surplus Sales Office, Sharpe General Depot, Lathrop, Calif.

Two More Minuteman Sites

The Air Force last week announced two more sites for Minuteman ICBM bases: Whiteman Air Force Base, Sedalia, Mo., and Minot Air Force Base, Minot, N. D.

This brings the total of Minuteman bases to four. The first, at Malmstrom AFB, Great Falls, Mont., is under construction (ENR Mar. 9, p 28) and the second, at Ellsworth AFB, Rapid City, S. D., will be advertised for bid next week (ENR June 15, p. 17).

Each of the four sites is scheduled to have 150 underground launching pads for the Minuteman. The Corps of Engineers Ballistic Missile Construction Office in Los Angeles, hasn't made public its estimated construction cost for the two new bases. The first base, at Malmstrom AFB, will cost $61.7 million for construction.

The Malmstrom AFB Minuteman base and, apparently, the other three bases will consist of three squadrons of 50 missiles each. Each squadron will break down into five flights of 10 Minuteman ICBMs.

All 150 missiles will be housed in underground silos as protection from bombardment from enemy ICBMs.

Each launching silo will be some 80 ft deep and have a 12-ft diameter. The Minuteman will stand unsupported in its silo, ready for firing at the press of a button. Powered by solid fuel, it can be left unattended.

Around the World . . .

• **The pension perennial**—The House of Representatives again passed the bill by Rep. Eugene J. Keogh, (D., N. Y.) to let consulting engineers, architects and other self-employed persons defer payment of income taxes on 10% of their current income, up to $2,500 a year, if the money is used to establish pension funds. The Senate is likely to sit on the measure, until it gets the Administration's tax-reform package next year.

• **Molded joints get the nod**—Metropolitan St. Louis Sewer District is specifying factory-molded compression joints for all new vitrified clay sewers—21 in. dia or smaller. The District hopes to eliminate infiltration of storm flows into sanitary sewers by outlawing caulked joints.

• **Getting the most out of waste**—City officials in Milwaukee are negotiating with an electrical utility for the sale of the power output of a proposed refuse incinerator equipped with a generator. The city anticipated the 40,000 kw from the garbage-fired steam plant would completely cover incineration costs.

• **Quick quake quotes**—A network of modern earthquake recording equipment that will improve detection of quakes and general earth vibrations is going to be installed at 125 existing earthquake stations around the world. Work will be done by the U. S. Coast and Geodetic Survey with financial support from the Department of Defense.

• **Demolition boom**—Preceding construction of major projects in Baltimore, a boom in demolition work is under way in that city. A $25-million federal office building, low-rent housing projects, several industrial parks, a university campus, a complex of three state office buildings and several private office towers are sparking demolition of slums.

• **Composite beam patented**—Steel fabricators and erectors will be more concerned than designers over a patent issued recently. It covers composite steel-concrete construction with welded stud shear connectors. Robert C. Singleton and Richard E. McGinnis, vice presidents, Gregory Industries, Inc., Lorain, Ohio, stud manufacturer, received the patent.

• **Swimming city**—Atlanta's water department has jumped into the pool-filling business to meet a flood of requests from the city's 1,000 to 1,400 private pool owners. A special crew fills the average pool in four or five hours from nearby fire plugs. The job takes days using a household faucet. Backyard bathers pay between $60 and $70 for the service.

• **Room at the top**—Rooftop parking for 450 automobiles will be the major feature of the Mueller Co. manufacturing plant in Decatur, Ill. Virginia Engineering Co., Inc., of Newport News, Va., is building the $5-million plant; Sverdrup & Parcel of St. Louis are architects.

• **Rivers plan due July '62**—A federal study commission says a comprehensive plan for development of seven Texas river basins will be ready by July 1, 1962. The commission, established by Congress in 1959 (ENR Feb. 5, 1959, p. 55), has complied all necessary data and is now preparing a broad guide plan for the Neches, Trinity, Colorado, San Jacinto, Brazos, San Antonio, and Guadalupe rivers. To date the study group has spent $2.3 million.

• **DC power line in USSR**—The Soviets are planning another extra-high-voltage, direct-current power transmission line—this one to operate at 1.5 million volts. The line will extend some 1,500 miles from hydroelectric plants in Siberia to the Ural region. An 800,000-volt line already under construction will link Stalingrad and the Donbass. Application of dc rather than ac on both lines is expected to cut construction costs and reduce power losses.

• **Earthquake repair**—The Chilean government's plan to build 11 small country villages in southern provinces hardest hit by last year's earthquake will be financed from a $20-million gift from the U. S. government. Cost of building 30 to 80 dwelling units, a school, a clinic and a civic hall for each village is estimated at $2 million plus.

• **Crazy, man**—Bid prices on federal-aid highway construction dropped again in the first quarter of 1961, according to the Bureau of Public Roads. The composite mile index is now 158.7 (1925-29 base). In 1953, it was 160.2.

John Philip Hogan Dies; Former ASCE President

Col. John Philip Hogan, specialist in water supply and hydro power, died June 9 in Santa Barbara, Calif.

Colonel Hogan had been chief engineer and later vice-president of the 1939-40 New York World's Fair. He was president of the American Society of Civil Engineers in 1940 and a vice-president of the Society of American Military Engineers.

As a partner in the firm of Parsons, Brinckerhoff, Hogan & MacDonald of New York from 1926 to 1947, he was a consultant to many private utilities, to industry, to New York City, New York State and the U. S. Army.

In the 1930s Colonel Hogan served as a consultant to the Corps of Engineers on construction and marketing of power for the $54-million Bonneville Dam project.

His now-famous report on harnessing the potential of the Delaware River was also done for the Corps.

When the United States built air bases in the Caribbean, Colonel Hogan's firm in association with Voorhees, Walker, Foley & Smith, was selected to design and supervise their construction. He was in charge of this work as well as other U. S. projects during World War II.

In World War I, Colonel Hogan served with the Eleventh Engineers.

Eduardo Torroja Dies; Spanish Concrete Genius

Spanish engineer Eduardo Torroja, one of the world's foremost authorities on thin-shell concrete construction, has died.

The 61-year-old engineer had been a pioneer in reinforced concrete since his graduation from Madrid's School of Engineering in 1923. In the early Thirties, he fathered such master works as the Zarzuela hippodrome, with its sweeping concrete marquee, and the Recoletos Jai Alai Stadium, whose 178 x 108 ft cylindrical concrete shell withstood repeated bombardments in the Spanish Civil War.

More recently, he designed the Algeciras market place, a 157-ft spherical shell dome, and the Esla Viaduct, with its 689-ft main span.

Mr. Torroja firmly believed that concrete was the world's finest construction material. He spent his lifetime building in concrete and teaching others the new methods he had perfected. Before World War II, he was professor of Elasticity of Concrete Structures at the School of Engineering and later he created and directed the Institute of Construction and Cement, an intstitution for research and experimentation in concrete construction.

PROVEN,
LOW-COST
WAY
TO AVOID
THIS

immediate protection against roadside erosion...

SOIL SAVER

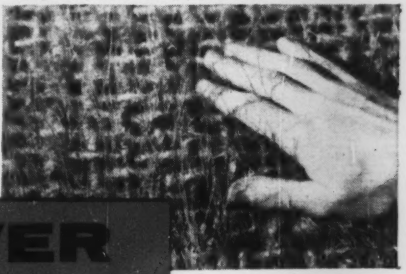
Each day, erosion from rain and water run-off cuts into the highway investment of every state. If you share in the responsibilities of highway planning, building and renewal, then erosion, its defeat and prevention, is your concern. You, of all people, should know about Soil Saver.

Soil Saver is a heavy jute mesh. It is simple as dirt, and almost as cheap! It costs, in fact, some 75% less than sod, and 1400% less than asphalt or concrete paving. Wind, water or growing grass cannot displace it. Many leading state highway design engineers across the nation now include it in their original specifications. They have seen how it protects seed and soil in critical areas until grasses take over.

Soil Saver belongs in your plans. Get the facts ... write for full details to Dept. EN-61.

LUDLOW TEXTILE PRODUCTS
NEEDHAM HEIGHTS 94, MASS.
A Division of Ludlow Corporation

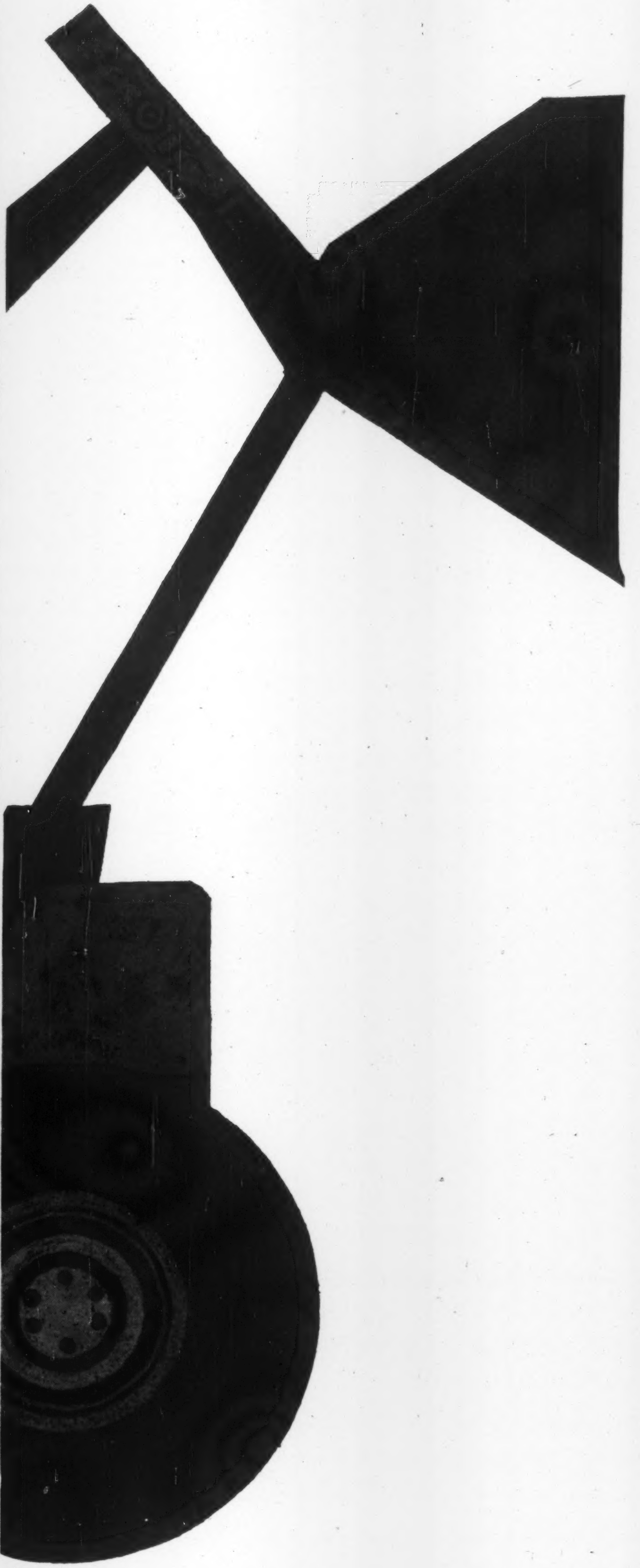
ABOVE: Soil Saver applied to critical center of steep grade median strip. **BELOW:** Stabilizing grass growing through Soil Saver heavy jute mesh.



Ludlow

SOIL SAVER
Heavy Jute Mesh
SIMPLE AS DIRT AND ALMOST AS CHEAP

CUMMINS DIESEL



STANDARDIZE ON CUMMINS

ONLY CUMMINS OFFERS 45 CONSTRUCTION-PROVED DIESELS FROM 70 TO 700 HORSEPOWER!

Across the country, men in all phases of construction work are standardizing on Cummins Diesels. Why? For three very important reasons:

Only Cummins offers the complete range of diesel power needed for today's construction requirements. You can specify 4, 6, 8 and 12 cylinder models; naturally aspirated, supercharged or turbocharged. Match your power needs exactly, no costly underpowering . . . no wasteful overpowering.

Cummins service is readily available—anywhere! Prompt, expert help at the jobsite keeps your Cummins operating profitably. Parts and factory-trained service experts are available 24 hours a day at service points across the nation.

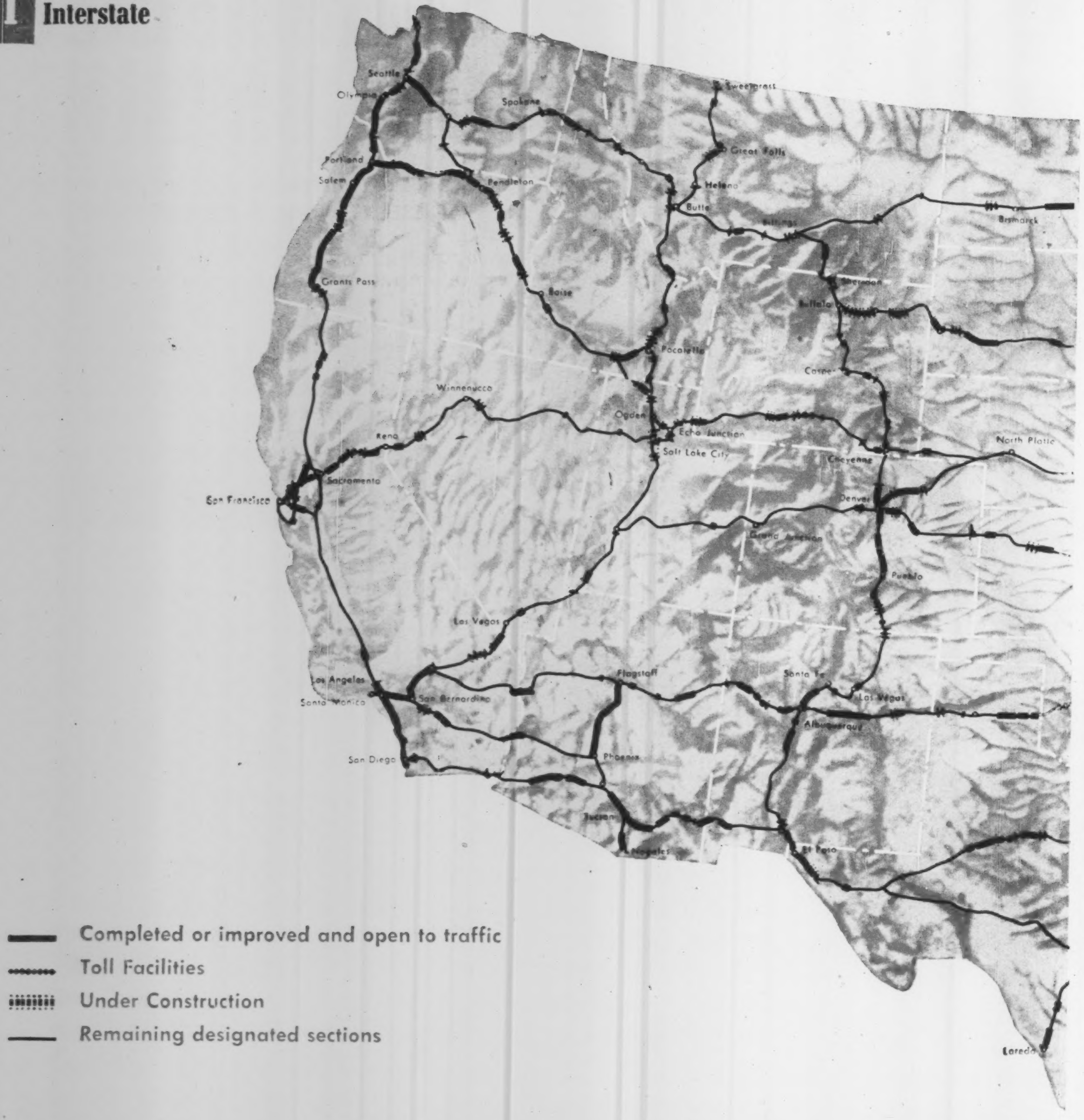
Standardization substantially cuts operating costs. Cummins Diesels are designed to permit maximum parts interchangeability. By standardizing on Cummins, you minimize parts inventory, increase the efficiency of your service work and reduce labor costs. You increase availability . . . increase profits.

Cummins power is available in more than 550 models of construction machines. Contact your equipment dealer or Cummins Distributor for details.
Cummins Engine Company, Inc., Columbus, Indiana.

CUMMINS

70HP to 700HP

1 Interstate

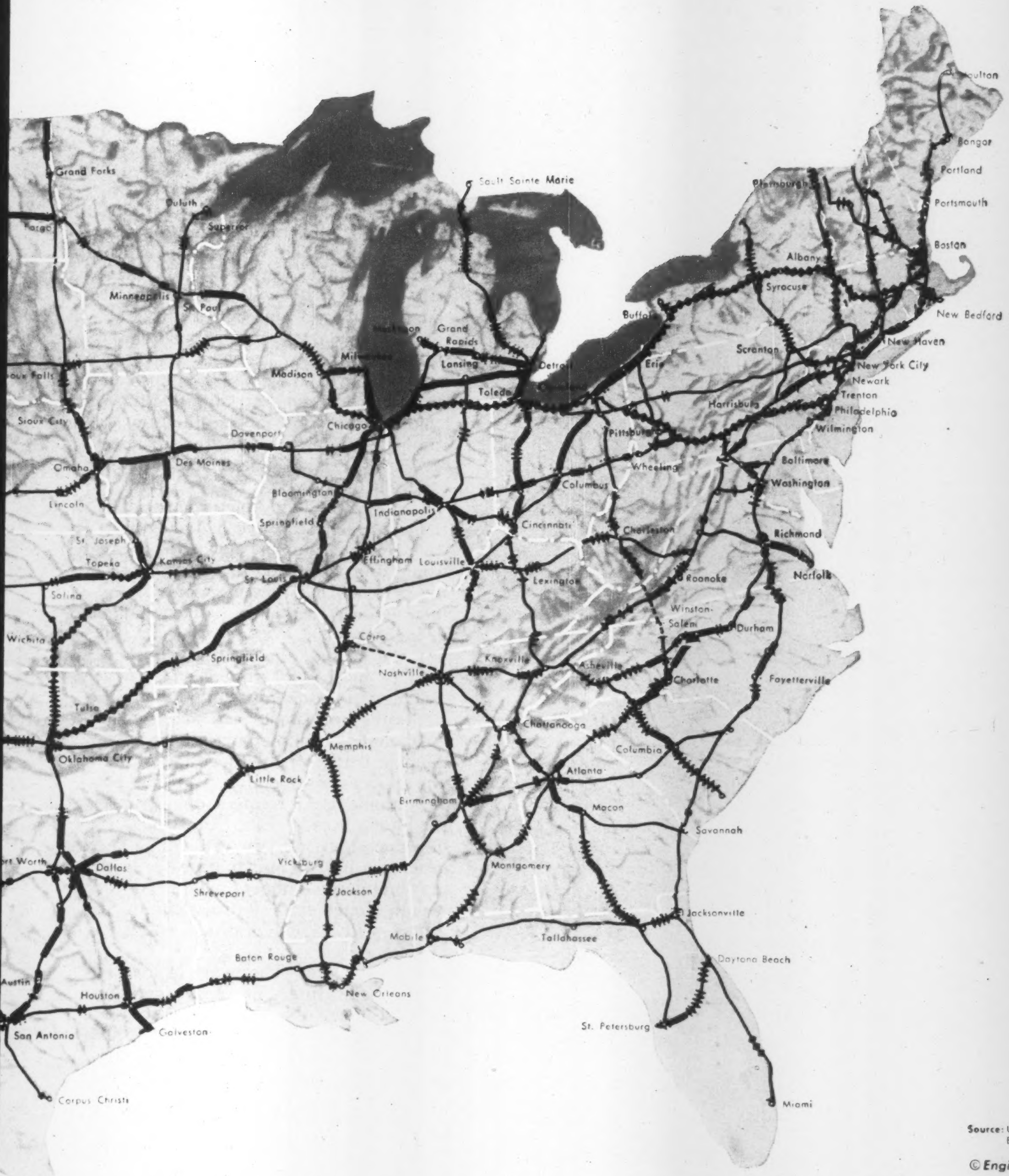

Seattle
Olympia
Spokane
Sweetgrass
Great Falls
Helena
Butte
Billings
Bismarck
Portland
Salem
Pendleton
Grants Pass
Boise
Sheridan
Buffalo
Pocatello
Casper
Winnemucca
Ogden
Echo Junction
Salt Lake City
North Platte
Reno
Sacramento
San Francisco
Cheyenne
Denver
Grand Junction
Pueblo
Las Vegas
Los Angeles
Santa Monica
San Bernardino
Flagstaff
Santa Fe
Las Vegas
Albuquerque
San Diego
Phoenix
Tucson
Nogales
El Paso
Laredo
Completed or improved and open to traffic
Toll Facilities
Under Construction
Remaining designated sections

Federal-Aid Highways After Five

The fifth anniversary of the Federal-Aid Highway Act of 1956 finds the act's most important product, the National System of Interstate and Defense Highways, taking shape, emerging as a network of superb expressways.

The 41,000-mile Interstate System is now more than one-quarter built. In its latest progress report, the Bureau of Public Roads announced that 10,600 miles were completed and all but three of these miles opened to traffic. Construction under the Interstate program doesn't account for all this mileage. Tollroads, bridges and tunnels incorporated in the system, as permitted by law, totaled 2,267 miles.

The bureau reported construction under way on 4,400 miles and engineering and right-of-way work in progress on another 10,405 miles. Some form of


Houlton
Bangor
Portland
Portsmouth
Boston
New Bedford
Plattsburgh
Albany
Syracuse
Buffalo
Scranton
New Haven
New York City
Newark
Trenton
Philadelphia
Wilmington
Harrisburg
Erie
Pittsburgh
Baltimore
Washington
Wheeling
Columbus
Charleston
Richmond
Norfolk
Roanoke
Winston-Salem
Durham
Fayetteville
Charlotte
Asheville
Columbia
Savannah
Atlanta
Macon
Chattanooga
Knoxville
Nashville
Lexington
Cincinnati
Louisville
Indianapolis
Effingham
Sault Sainte Marie
Muskegon
Grand Rapids
Lansing
Detroit
Toledo
Cleveland
Milwaukee
Madison
Chicago
Davenport
Des Moines
Bloomington
Springfield
St. Louis
Cairo
Grand Forks
Fargo
Duluth
Superior
Minneapolis
St. Paul
Sioux Falls
Sioux City
Omaha
Lincoln
St. Joseph
Topeka
Kansas City
Salina
Wichita
Springfield
Tulsa
Oklahoma City
Little Rock
Memphis
Birmingham
Montgomery
Jacksonville
Tallahassee
Daytona Beach
St. Petersburg
Miami
Mobile
New Orleans
Baton Rouge
Jackson
Vicksburg
Shreveport
Dallas
Fort Worth
Austin
Houston
Galveston
San Antonio
Corpus Christi

Source: U.S. Department of Commerce
Bureau of Public Roads

© Engineering News-Record

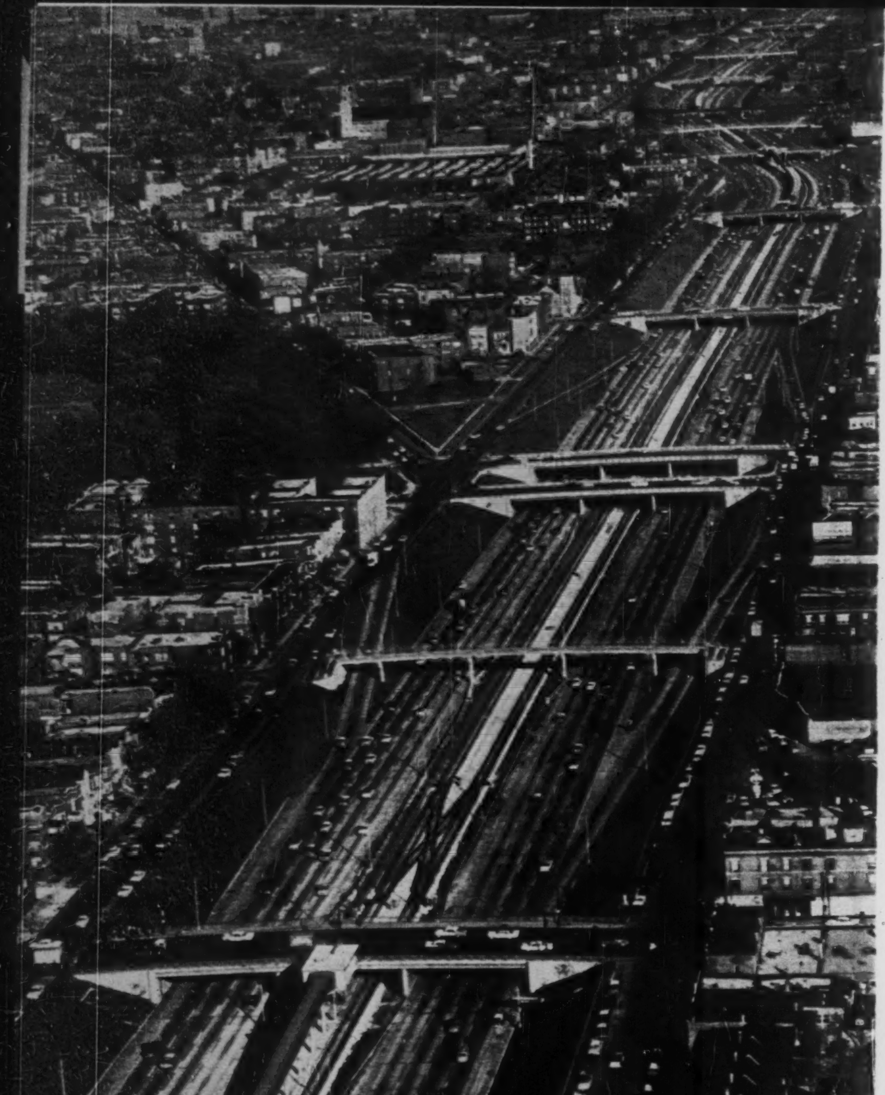
Years: Progress and Promise

work was either completed or under way on two-thirds of the system.

In the past five years $10.4 billion have gone into the Interstate System, the federal government providing 90% and the states 10%.

The ABC program, under which the federal government and the states share equally the cost of improving primary and secondary highway systems and their urban extensions, reports completion of 115,493 miles since 1956. (Only the progress of the Interstate System appears on the map above.)

But roads are more than miles and dollars. They're engineering; they're construction. They're pavement; they're bridges. They're time saved; they're lives saved. For more of this special report on the first five years of the Interstate program turn the page.



URBAN EXPRESSWAYS offer drivers fast, safe, cheaper travel.

ENR Road Report

2 Benefits

New

In 1975 more than 50,000 Americans now classified statistically as corpses will be alive and driving. These are the persons who won't die in traffic accidents—thanks to construction of the 41,000-mile network of the National System of Interstate and Defense National Highways.

These 50,000 Americans and the rest of the 230 million who will be alive then will be able to ride over an Interstate System that will link 42 of 50 state capitals and nine out of ten of all cities of 50,000 or more population.

This expressway network will not only save lives, it will save billions in operating costs, reduce commuting time, lengthen the scope of vacation travel, stimulate industrial growth, increase real estate values and make driving easier on the nerves.

Last year 38,000 Americans died in traffic accidents. If we had the Interstate System complete now, this figure would drop to 34,000 for 1961. A saving of 4,000 lives a year is one of the more modest estimates. They range as high as 9,000 lives per year. Without the system, the deaths are scheduled to hit 55,000 annually by 1970.

To grasp the enormity of 55,000 traffic deaths in a single year, imagine the total destruction of four infantry divisions in battle, or the execution of half the residents of Scranton, Pa. The pet measurement of a former Commissioner of Public Roads, Ellis Armstrong, is, imagine that all the casualties are placed in hearses and the hearses lined up bumper-to-bumper. This convoy would stretch from Indianapolis to St. Louis with 55,000 deaths.

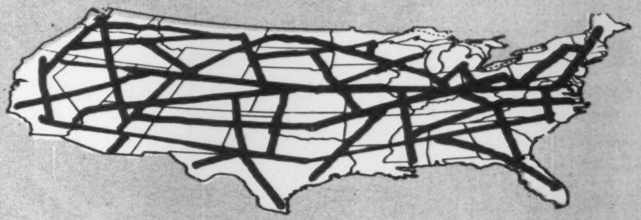
- **Why it's safer**—The secret of life saving on the Interstate System is controlled access. No access roads can be built into the system without specific authorization. This means that motorists will be able to drive along the expressways and freeways at high speeds without encountering the in-and-out traffic of intersecting roads, motels, drive-in movies, roadside frozen custard stands, gas stations and restaurants. These highways will also be free of traffic lights, stop signs, intersections, steep grades and sharp curves.

A recent report by the American Bridge, Tunnel & Turnpike Association illustrates the effectiveness of limited access highways. The number of traffic deaths on tollroads in 1960 was only 2.2 per 100 million vehicle miles of travel. (On New Jersey's 173-mile Garden State Parkway it was only 1.01 per million vehicle miles last year.) The rate for all highways last year was 5.3

Highways Make a Better U. S.

fatalities per 100 million vehicle miles. The Interstate System highways will be built to standards similar to those of tollroads.

By 1975 the Interstate System will mean . . .



- The United States will have a 41,000-mile expressway network that is free of traffic lights and intersections. It will link 42 of our 50 state capitals.
- 50,000 persons will be saved from death in traffic accidents.
- Motorists will save $725 million each year in traffic accident costs.
- The nation's drivers will make 9 billion fewer stops and starts per year.
- Reduced travel time will save owners of trucks and buses $825 million annually.
- One-quarter of all motor vehicle travel will be on Interstate highways.
- Commuters will be able to spend less time driving to and from their work.
- Roadbuilders will have used 48 million tons of steel, 7 billion bags of cement and 21 billion gallons of petroleum products constructing the Interstate System.
- Farmers will get faster transportation for perishable commodities
- Manufacturers will have broader access to the labor force.

Another example of this is shown in two highways south of Washington, D. C.; U. S. No. 1, a four-lane, non-divided highway without controlled access and, paralleling U. S. 1 is the Shirley Highway, a divided, controlled access highway of modern design. Traffic on the two highways is similar and drivers from the same general area use both. But the traffic fatality rate on U. S. No. 1 is 13 times that of the Shirley Highway, which has only 0.8 deaths in traffic accidents per million vehicle miles.

• Everyone pays for accidents—Last year 17.5 million motorists were involved in 10 million accidents. Since there are 87 million licensed drivers, it looks as though 70 million of them got off, but they didn't. All motorists pay for these accidents in high insurance rates. The cost of motor vehicle accidents in the U. S. soared from $1.6 billion in 1940 to $6.2 billion in 1959. At this rate, without the help of the Interstate System, they could go to $9.5 billion by 1975.

Reduced to comprehensible scale, the cost of accidents averages about $100 per vehicle annually, the equivalent of 14 cents for every gallon of gas a driver consumes.

The Bureau of Public Roads estimates that the Interstate System will save American motorists $725 million per year in traffic accidents. The BPR study further predicts savings of $550 million in gas consumption and brake and tire wear, and of $825 million to commercial vehicles in reduced travel time.

The elimination of stop-and-go driving will save users 9 billion costly stops and starts every year.

Probably the most painstaking examination into the potential benefits of the Interstate System has been made by Wilbur Smith and Associates, transportation research consultants of New Haven, Conn. The Automobile Manufacturers Association commissioned the firm to make a study of the system and its impact on urban transportation. The result is a 376-page report packed tightly with facts and projections from these facts.

The Wilbur Smith estimate of the saving potential of the Interstate network is, in brief:

"Although the system has only about 1.2% of total U. S. road and street mileage, it will carry about 24% of all motor vehicle travel when completed. Moreover, nearly 40% of all motor vehicle owners in the nation will make daily use of the system.

"Because of the superior safety and traffic-carrying capacity of modern freeways as compared to ordinary streets and highways, the Interstate System also will save motorists more than 2 cents per mile in urban sections as a result of lower accident, fuel and vehicle maintenance costs, and about 1 cent per mile on rural sections. The accident reduction also means an annual saving of more than 9,000 lives when the entire 41,000-mile system is completed.

"By 1980 the system will be producing yearly savings to motorists of $5 billion in the form of reduced traffic accidents and other vehicle operating costs. Thus, the motoring cost savings will equal the total cost of the system in about eight years.

"In addition, some 4 billion vehicle-hours will be saved yearly by motorists using the Interstate System. If a monetary value of about $1.65 per hour were placed on this time saving, it would amount to over $6.5 billion per year.

"The accumulative net benefits to motorists that will result from completion of the remaining portions of the Interstate System on schedule between 1961 and 1972 will total $98 billion over the next 20 years. A total of 75,000 lives will be saved in this same period."

Put down in a more individualized fashion, the average commuter drives 13 miles back and forth to work daily. He stands to save 2 cents a mile in operating expenses driving on expressways as compared with travel on conventional streets. This adds up to $60 a year, plus savings in accident and repair costs.

In urban areas, the cost of driving over controlled access highways offers a saving of as much as 4 cents a mile over the cost of operation on urban streets.

The Automobile Club of Southern California found that motorists on the Arroyo Seco Freeway got 20.75 miles per gallon of gas, as compared with 8.7 miles per gallon drivers got on adjacent streets.

For private motorists, the saving is easy to calculate. The average of the country's more than 60 million passenger cars runs about 10,000 miles a year. A saving of one cent a mile adds up to $100.

• More miles in less time—Controlled access highways in urban areas save drivers not only money, but time. An Automotive Safety Foundation shows that in San Antonio freeway travel averages 39.7 mph, as compared with 13.4 mph on parallel streets; a 3-mile trip on Boston's Central Traffic Artery saves 20 minutes; in Seattle, motorists using the Alaska Freeway save about eight minutes per trip.

A six-lane controlled access highway will carry as much traffic as 15 to 20 lanes of city streets. It can carry heavy traffic flows at two or three times the speed possible on adjacent city streets and at one-half to one-third the accident rate.

These time savings mean commuters can either spend less time traveling to and from work or that they can compete for jobs in business and industry farther away from their homes.

The Bureau of Public Roads reported a test run a trucking company made between Chicago and Jersey City. Using tollroads and expressways, the company made the 1,700-mile round trip in 11 hours and 17 minutes less time than its trucks could do on older, parallel routes.

The trucking company counted a 30½-gallon saving in gasoline, 2,339 fewer shifts of gears, 696 fewer brake applications and 185 fewer full stops. On the basis of 5.52 cents a minute operating cost for a tractor-semi-trailer combination, the trucking company saved $37.30 per round trip.

• Expressways pay as you go—Savings on an area-wide basis are considerably more imposing. In Ohio on a 15-mile section of Interstate 75 near Bluffton users save some $800,000 a year. A 15-mile stretch of Interstate 85 near Salisbury, N. C., has already saved motorists over $1 million. On Interstate 25 in Colorado the saving for a 34-mile stretch is $1.8 million per year.

Studies of the Schuylkill Expressway in Philadelphia show that motorists in the area save $18 million a year in direct commuting costs. These savings alone will pay for the total cost of the limited access expressway in three years.

• Interstate and real estate—The Interstate System often takes a long time to gain public acceptance, especially among those whose land it will run through or next to. Admittedly, it will consume a huge amount of land, 1.5 million acres, an area half the size of Connecticut. But, even before the Interstate System appeared, 22 million acres of the U. S. were devoted to highway right-of-way. The Interstate right-of-way will cost $5.5 billion for 750,000 parcels of land.

RURAL HIGHWAYS will increase number of specialized farms.

Urban critics claim that the Interstate System removes too much valuable property from city and county tax rolls, resulting in a financial loss for these governments and the citizens who pay taxes.

"While this is happening, there is a more than compensating occurrence," says Ellis Armstrong, now president of Better Highways Information Foundation. "Land along the expressways becomes more desirable, is assessed at higher values, and thereby brings in larger tax revenues. Certainly there is not likely to be a net loss; often there is a considerable gain in revenues.

"The attractiveness of sites near modern-type highways for industrial developments has been established fairly conclusively. For example, more than $650 million worth of industrial, commercial and residential development has been attracted to sites along the 560-mile route of the New York Thruway (now part of the Interstate System).

"During a recent period an area close to the Eastshore Freeway in California comprising only 9% of the total industrial acreage in Alameda County accounted for over 43% of dollars invested in new industries.

"In Indiana, almost half of the 354 new industrial plants established during the past three years are located within a 45-mile band straddling the Indiana Turnpike (now part of the Interstate System). A similar intensification has been observed in areas near the Dallas Central Expressway, in Texas."

Along Massachusetts' Route 128, near Boston, 227 companies built 17 industrial parks and $175 million worth of buildings to house 28,000 workers in the last few years. In mid-1955, however, there were only 39 companies in operation and 14 others under construction.

"The economy and flexibility of the truck and the automobile have been enhanced by the development of the divided lane, limited access highway, which has therefore become an industrial location factor as important as the rail-waterway network of earlier years," says a report by Arthur D. Little, Inc., Cambridge, Mass., consulting engineering firm.

As the importance of expressways to industry the Little report noted:

- They make plants easily accessible to the labor force.
- Many sites adjacent to freeways offer room for modern, spread out, one- and two-story plants.
- Publicity-conscious producers of consumer goods like to build plants that can be seen by the automobile-owning public.

The average suburban houseowner would, on first consideration, rather have a massive invasion by termites than have an expressway running near his property. But investigation has shown that freeway construction usually increases the value of residential land near it. The value of property immediately abutting on the freeway is temporarily depressed and the value of property a few feet away is enhanced significantly. Construction of an Interstate highway invariably adds considerably to the value of new subdivision areas to which it gives some access.

Construction of a freeway in Seattle

INDUSTRY puts a premium on land near modern highways, causing rise in real estate values.

increased the value of suburban areas it serves by 70%. Studies in California show that little loss in desirability of homes directly adjoining freeways occurs (about 1% or 2%) and the desirability of homes 100 to 400 ft away increases markedly within a short time.

Private land near the Arroyo Seco Freeway in California increased from three to 12 times in value after completion of the route. In Houston, Tex., land adjacent to the Gulf Freeway that was worth six to eight cents a square foot in 1945, before the highway was built, was worth 60 cents per sq ft 15 years later.

As a group, farmers probably show the greatest animosity toward the Interstate System. In the short run, they have a legitimate complaint. The network of highways will cross one-third of all counties in the U. S. Its 50-acre-per-mile right-of-way will demand part of all the acreage of 75,000 farm operating units. Despite the amount of land involved, the Interstate System will require only 0.1% of the farm area in the U. S.

"Building of the Interstate System will change dramatically the face of the rural countryside and the lives of our 3.5 million farmers," say William C. Pendleton and Raymond D. Vlasin, economists with the Department of Agriculture.

These men predict that the economic effects will be largely favorable, especially to producers of perishable commodities, who will benefit much from speedier transportation. They predict that the Interstate highways will encourage specialization and large-scale production.

• **A boon to builders.** The Interstate System has had its greatest immediate impact on the construction industry. Since passage of the Federal-Aid Highway Act of 1956, 1.5 million people have worked on more than 50,000 contracts for federal-aid highway work, most of it on the projects of the Interstate System.

Each $1 billion of federal-aid highway work in active construction status generates on-site employment for about 50,000 men with a weekly payroll of $4.7 million.

Construction of the Interstate System will require: 23 million tons of structural steel, 25 million tons of reinforcing steel, 12 million tons of corrugated metal pipe and miscellaneous steel, 16 billion tons of aggregate, 7 billion sacks of cement, 10 billion board feet of lumber and 21 billion gallons of petroleum products.

Construction will account for 83% of the total cost of the Interstate System, with 13.5% going for right-of-way and 3.5% for engineering. Half the construction expenses will go for materials, 23% for labor and 26% for equipment.

The construction costs will be divided almost equally among earthmoving, paving, and erection of bridges and overpasses.

Slightly less than half the expense of the Interstate System will go to build the 6,700 miles of the network that will go through urban areas. These stretches will cost an average of $4 million a mile, but they will carry one-half of the Interstate traffic.

The predictions of the future benefits of the Interstate highways to business, industry, farmers, commuters and motorists usually provokes the average motorist to ask: "But where are the Interstate highways?" He assumes that since a 16-year program (1956-1972) is five years old, five-sixteenths of the Interstate highways should be built.

Just as the automobile he drives probably spent nine months on the drafting board before the manufacturer began to produce it, it takes 21 months of work on a highway project from the time it is programmed before actual construction begins.

But the Interstate System, often built in scattered sections, is taking shape. Some of the impressive sections now open to traffic are:

- Wisconsin—44 miles of Interstate 90 between Hudson and Menomonie.
- North Dakota—86 miles of Interstate 94.
- Georgia—37 miles of Interstate 75 in Tift and Turner counties.
- Connecticut—the Hartford-Springfield (Mass.) Expressway.
- Arizona—55 miles of Interstate 17 between Flagstaff and Verde Valley.
- Michigan—85 miles of Interstate 94 between Jackson and Paw Paw.
- North Carolina—46 miles of Interstate 95.
- Ohio—44 miles of Interstate 90.

The immediate expense of the Interstate System is high, high in money, in time and in effort. But, as transportation economists enjoy remarking, "We pay for good roads whether we build them or not and we pay more if we don't build them."

We're building them – engineering them and constructing them today as never before—and tomorrow, better than today. Please turn to p. 69 for more of this report on roadbuilding.

A salute
to the builders
of the world's greatest
highway network...

IT'S TIME TO CHEER AMERICA'S GROWING NEW INTERSTATE HIGHWAY SYSTEM!

A saving of 4,000 lives each year is promised by the design of Interstate System highways, including controlled entries and exits, no cross traffic, and the uniform skid-resistance of concrete. Reduced accidents also save dollars—in 5 years, an estimated 9% of the System's cost!

INTERSTATE

Millions of travelers this year will follow the red-white-and-blue signs for the greatest driving comfort, smoothness and safety ever known!

From farm-to-market roads to magnificent freeways, Americans today drive over some 824,382 miles of Federal-aid highways . . . the world's largest and finest road network!

So comprehensive are these highway systems that we take them for granted. Actually, they are the product of an infinite amount of planning by federal, state, county and city highway officials, and an equal amount of construction skill by engineers and contractors.

Backbone of our national highway network is the 41,000-mile National System of Interstate and Defense Highways. Never before in history has a road system been built of its scope and importance. Though comprising only a little more than one per cent of our total road and street network, eventually it will carry 20 to 25 per cent of the total highway traffic of the nation.

Tremendous progress has already been made. Today, more than a quarter of the Interstate Highway System is in use. From Maine to California, more than 10,000 separate Interstate projects are underway. And these are not ordinary roads as we have known them. By actual legislation, they are keyed to a new concept of American highway needs—the traffic of 1975.

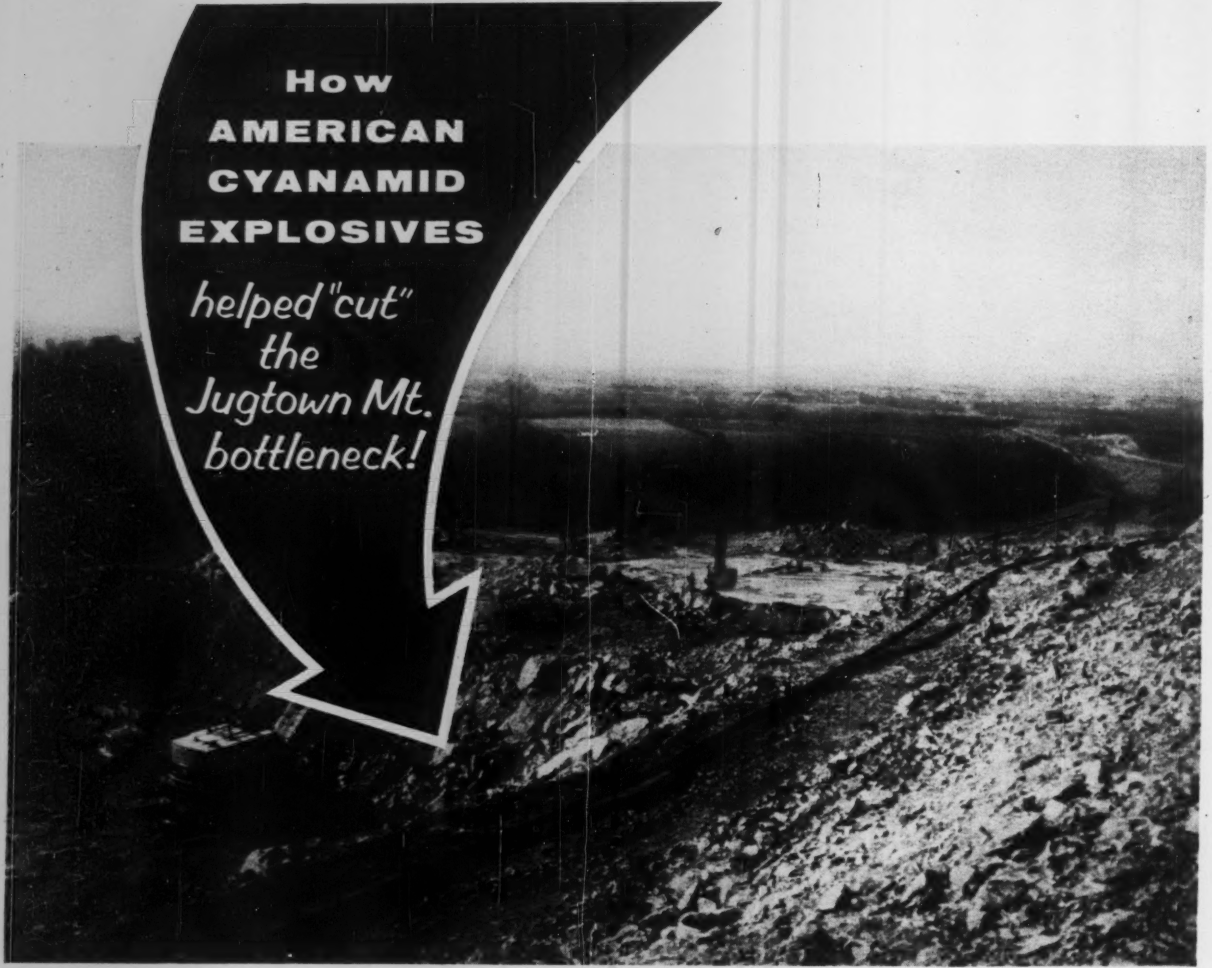
So vital is this network to our nation that 90% of the cost is being underwritten by the Federal Government. Highway engineers are determined to make these the best and safest highways ever known. Behind the Interstate System are the best engineering brains, the greatest pool of scientific knowledge, the most modern equipment ever brought to bear on a highway project.

Naturally, the preferred pavement for the Interstate System is concrete. It's the one pavement that lets engineers design highways to last 50 years and more That means low upkeep and big savings of tax dollars.

PORTLAND CEMENT ASSOCIATION

A national organization to improve and extend the uses of concrete

How AMERICAN CYANAMID EXPLOSIVES *helped "cut" the Jugtown Mt. bottleneck!*



Cyanamid explosives recently helped Yonkers Contracting Co. execute one of the toughest jobs on the N. J. portion of Interstate Highway 78, the Jugtown Mt. rock cut, designed to replace a steep, narrow existing road.

This $6.3 million contract included 5 cuts and 3½ million cu. yds. of excavation, but the make or break part of the job was the 1½ million yards of tough gneiss granite in the Jugtown cut.

To accomplish this engineering feat within the low competitive bid and a tight 440 day timetable, Yonkers assembled an impressive earthmoving fleet* and a top maintenance crew to keep equipment rolling. However, the key to the operation's success was a blasting schedule to assure continuous loading for maximum utilization of equipment.

An unusual combination of 40% Ammonia, CYADYN® 1 dynamite and ACCOMITE® blasting agent was selected and an effective shot pattern planned. Blasting proceeded on schedule. Fragmentation was perfect for fast, easy handling. Secondary blasting was practically eliminated. Trucks rolled 10 hours a day without damage or delay.

Cyanamid offers a complete line of dependable high quality explosives, promptly delivered from coast to coast, plus cost-cutting assistance in their best use. For complete information, contact our nearest office.

---

*3 Northwest 80-D's, 2 Bucyrus-Erie 88-B's, a Northwest Model 6 Hoe, 15 International 95 Payhaulers, 10 Euclid 66's, 7 21-yd. Euclid scrapers, 11 International TD-24 dozers, a Cat D9, 2 Adams and 1 Cat No. 14 motor graders.

AMERICAN
CYANAMID
EXPLOSIVES

AMERICAN CYANAMID COMPANY
EXPLOSIVES AND MINING CHEMICALS DEPARTMENT
30 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.

Explosives • Electric Blasting Caps and Accessories
Blasting Agents • Chemical Grout • Mining Chemicals

3 Engineering

Machines Revolutionize Methods

In the first five years of the accelerated federal highway program, highway engineering has gone electronic.

Those twin marvels—the electronic computer and aerial photogrammetry—have revolutionized highway planning, location, design and administration. And there are clear indications that an electronically sparked revolution in traffic operations and control is on the way.

Comparatively new five years ago, "first-generation" computer applications are firmly entrenched in the highway and bridge field. And the "second generation" of faster, more sophisticated machines (ENR Apr. 14, 1960, p. 40) is opening wide, new vistas. On the horizon is the full utilization by highway departments of integrated data processing systems built around today's high-speed computers.

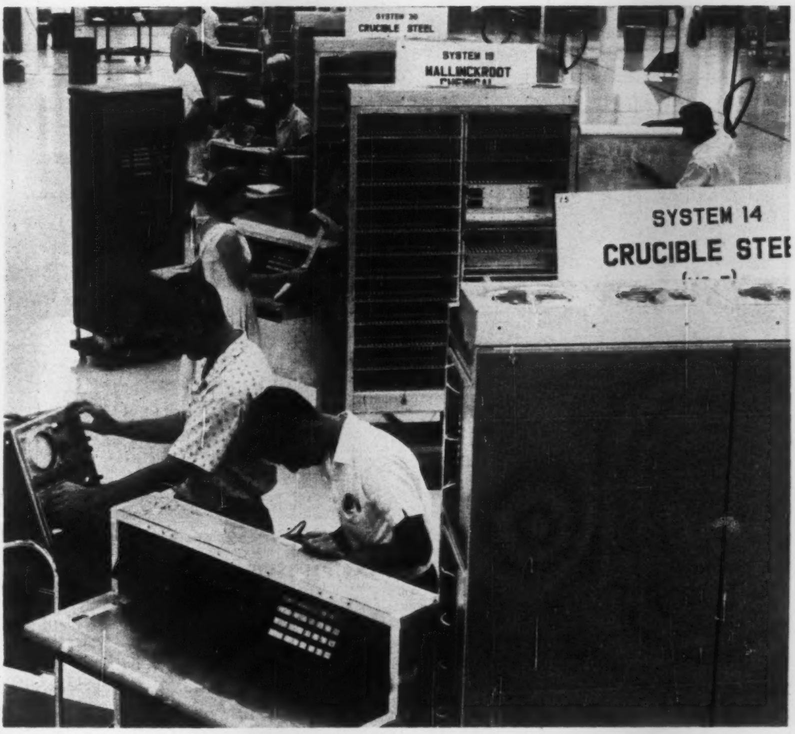
Last December, H. A. Radzikowski of the Bureau of Public Roads reported that 49 of the 53 member departments of the American Association of State Highway Officials were using electronic computers. Two of the four remaining departments had ordered machines of this type. Five years ago, highway department use of electronic computers was in the pioneering stages.

There are now more than 400 programs in the computer library of the Bureau of Public Roads. The programs cover nearly every phase of highway engineering and administration. They have been developed by government agencies, consulting engineers and educational institutions.

Electronic computers have value for highway and bridge engineers for two basic reasons—high calculating speed and ability to handle vast masses of data. Because of these, they are ideal tools for planning, location and design.

• Urban planning—Computers are now making it possible—for the first time—to do a first-rate job of urban transportation planning.

Before, traffic engineers could—and did—gather tremendous amounts of information about origins and destinations, traffic volumes, speed and delay, types of vehicles and other items. They could—and did—analyze the data, make forecasts, predict traffic performance and estimate needs. But, in large metropolitan areas, engineers could examine in detail only a small proportion of possible alternates.



COMPUTERS find many uses in road engineering, administration.

Now, they can look at nearly all variables and alternate proposals.

For example, a joint effort of BPR, the District of Columbia Department of Highways and the General Electric Company developed a large-computer program to assign estimated future traffic to the various segments of a proposed urban highway network, if built. Written into the program are provisions for estimating travel times and turning movements on the proposed facilities and for comparing them with similar items on existing routes.

Any number of alternative plans can be evaluated quickly to determine the optimum system for any urban area, including both existing and proposed facilities, to serve current and anticipated traffic demands. The program has been used in Washington, D. C.; Minneapolis-St. Paul; Charleston, W. Va; and Columbus, Ohio.

The traffic assignment program blends with an earlier one that permits maximum use of origin and destination survey data in forecasting traffic movement between zones in a study area.

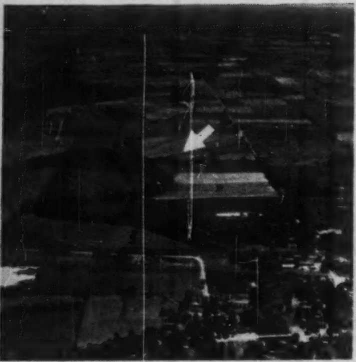
Last year, traffic engineers of the Missouri State Highway Department adapted BPR's large-computer traffic assignment program to the smaller IBM 650, the computer most commonly used by highway departments across the country. Engineers have put the program to good use in studying expressway plans in Kansas City and St. Louis.

Traffic engineers do not agree completely as to the best method to be used in forecasting traffic; hence, several programs, based on somewhat different philosophies, have been developed by different agencies. Techniques for presenting the results of origin and destination surveys also vary. One ingenious device is the cartographatron used in the Chicago Area Transportation Study (ENR Aug. 25, 1960, p. 55).

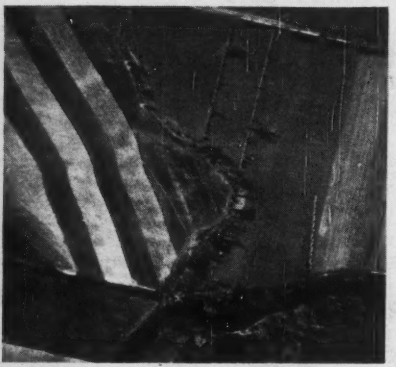
• Location and design—Uses of electronic computers in location studies and geometric design are legion. Their purpose primarily is to speed repetitive calculations and free engineers from time-consuming tasks that require little or no engineering judgment. Greatest application to-date is in the area of survey and plan computations associated with horizontal and vertical alignment and earthwork. Computers are used as a part of reconnaissance and preliminary surveys, final location surveys and, in a few cases, measurement of final quantities for payment to contractors.

Typical computer programs of this type include traverse adjustment, centerline coordinates, profile data, curve data, cross sections, earthwork quantities, borrow pit quantities and right-of-way boundaries. Twenty-eight highway departments have either eliminated or are planning to eliminate drawn cross sections for embankment construction, except where needed for special purposes. Instead, cross section data will be supplied in digital form as printed out by a computer.

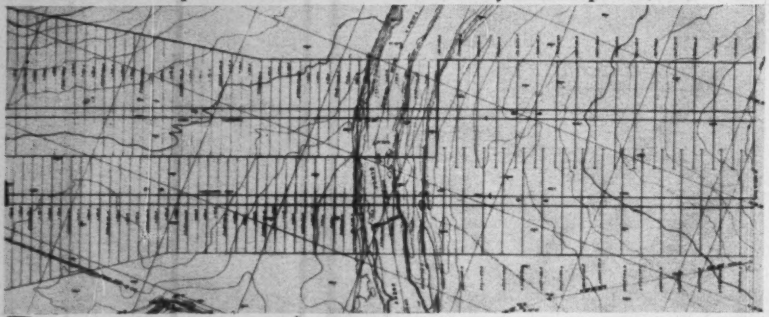
Seven departments are using tabulating equipment to mechanically plot mass diagrams, catch point profiles or plan views of catch points. Three additional departments plan to adopt this method. One state uses this equipment to plot cross sections automatically.



1 Oblique air view shows area through which road will pass.



2 Vertical photograph is one of a pair for study in stereoplotter.



5 Detailed topographic map shows roadway center line, earthwork cross sections and other engineering data. Scale is 1 in. = 50 ft, 2-ft contours.

AERIAL PHOTOS AND COMPUTER join forces to produce rapid highway location

• **Aerial photogrammetry** — Thirty-five highway departments use aerial photography for the reconnaissance and preliminary stages of location and design. Two are using this technique for as-built records, a new application. One state uses photographic equipment in the development of plans and makes all payments to contractors on plan quantities. Another in 1960 made final payments to contractors on 231 miles of highways based on photogrammetric measurement of earthwork quantities.

A large number of departments use air photo interpretation to locate aggregates, determine soil types or estimate subsurface conditions.

Seventeen highway departments obtain cross section data directly from aerial photographs mounted in a stereo plotter. Some of them have adopted automatic data recording equipment for this purpose.

• **Photo-computer combination**—There are many ways to link aerial photography with a computer for highway design and plan preparation. One consulting engineer does it this way:

Technicians prepare an aerial mosaic to the scale 1 in. = 1,000 ft, covering a strip perhaps 3 miles wide. Engineers establish the general location by study of the aerial photographs and Geological Survey quadrangle maps. Field reconnaissance, soil and geologic research and interpretation accompany visual study of the photographs.

More detailed location is done on a 1 in. = 200 ft, 5-ft contour topographic map developed by use of a stereoplotter (Kelsh plotter). Traverse computations for control and orientation of the photographs and map are done on the computer. Engineers then develop the detailed alignment on the topographic map, taking all factors into consideration. They obtain detailed soil information from borings or seismic studies and also look at land use and property ownership at this stage.

Designers then prepare the final design on 1 in. = 50 ft, 2-ft contour topographic maps. They use the computer to determine curve data, intersection layouts, ramp design, profile and earthwork calculations. In this case, earthwork cross sections are determined on a high-speed stereoplotter linked to a digital output unit; data come out in the form of typed manuscript or punched tape. Operators then can feed the cross section data into the computer.

The computer makes it easy for designers to shift the grade line as necessary to achieve a balance in cut and fill quantities. Final data are used in the manual preparation of contract plans.

• **Bridge and pavement design**—Computers are powerful aids to engineers who design bridges and pavements.

Bridge designers can compare alternate designs and materials far more readily than in the past, with resulting economy in construction costs. And computers permit the solution of problems not previously approached because of the degree of their mathematical complexity.

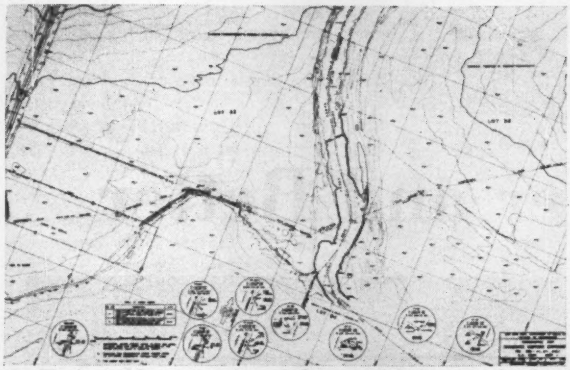
Most important uses of the computer in bridge design are in determining bridge geometrics (as in skewed locations or with curving alignment) and in proportioning indeterminate structures. Widespread attention is being given to the design of continuous structures by computers.

Computers are purring away, analyzing more than 300 million pieces of data collected during load applications on the $27-million AASHO Test Road at Ottawa, Ill. Final results of the analysis will add substantially to knowledge about design of rigid and flexible pavements.

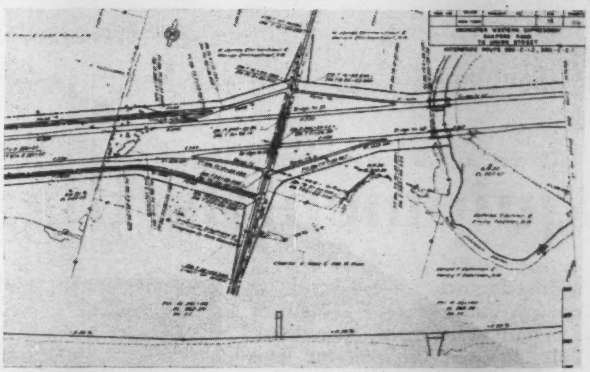
• **Administration**—Highway administrators are swinging high, wide and handsome in streamlining fiscal and management procedures using computers and related data processing systems. Prime uses are payroll processing, distribution of labor charges, cost analysis, equipment cost allocation and economic replacement and budgetary control. Computers also speed contract bid tabulations immensely (see p. 104).

• **Future practices**—What lies ahead for electronic computers in the highway field? Major developments probably will be these:

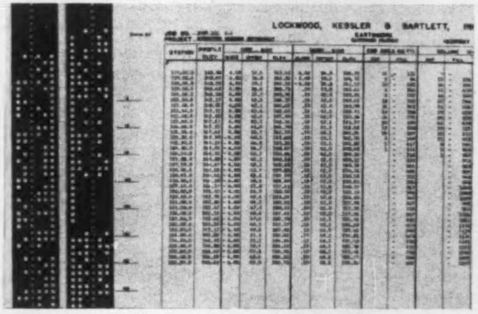
• Adoption of the new, second-gen-



3 Topographic map prepared from aerial photographs has scale of 1 in. = 50 ft, with 2-ft contours.

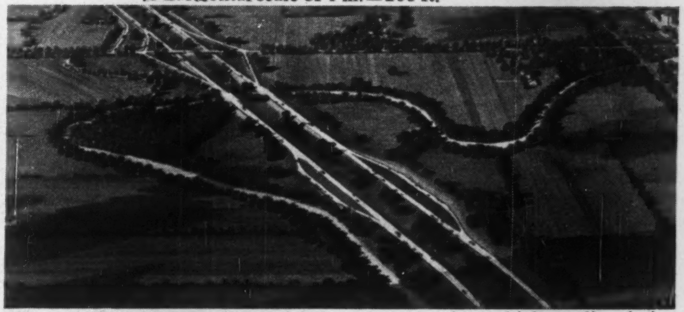


4 General plan and profile are shown on design sheet prepared to horizontal scale of 1 in. = 200 ft.



LOCKWOOD, KESSLER & BARTLETT, IN

6 Punched paper tape from stereoplotter goes into computer. Table shows results.



7 Artist's rendering of completed expressway shows high quality design achieved by integrated approach.

and design. Steps illustrate process used by an engineering consultant.

eration machines with their greater speed, capacity and logic. Development of common language systems for easier exchange of programs is rapid; already available are FORTRAN (an algebraic type language), ALGOL and COBOL.

- Integration of computer uses and applications within each highway department for optimum benefit to all concerned.
- Rapid transmission of data from the field to the computer center. Four highway departments have already installed teletype systems. Another is considering microwave radio. And card-to-card (or tape-to-tape) communication via telephone or telegraph wires (or wireless system) is available and under consideration by highway departments.

Further technical developments may be expected in the union of aerial photogrammetry and electronic computers. One of the most interesting is the optical-electronic scanning of aerial photographs for mapping (and other purposes). Several organizations are working on this process, which basically substitutes an electronic device for the eyes of the human being who now makes the stereoscopic determination and guides the plotting or measuring instruments.

Another step toward the complete automatic mapping approach is a device that scans the photographs and computes the data without forming images in a stereoplotting machine. Still another machine will scan the photographs and convert them immediately into digital information that can be stored in a computer.

• Other advanced methods – Highway engineers have adopted other modern mapping methods in the last five years. At least 15 highway departments use electronic distance measuring devices, either the Tellurometer or Geodimeter. Another two dozen use either electrical resistivity or refraction seismic equipment to investigate subsurface conditions.

Strip photography is coming into its own, with three new developments in use or on the way. Aerial mappers can now obtain a continuous vertical aerial photograph by using a shutterless camera with the rate of film movement synchronized with the ground speed of the airplane. Truck-mounted units can give a continuous strip film of a pavement or the roadway as seen by the driver.

Nuclear techniques are finding their way into the highway departments. Radioisotopes can be used to measure soil density and moisture content; check welds and steel reinforcing; control the level of liquids and solids in tanks or bins; measure thickness of coatings, such as traffic paints; and serve as tracers.

• Traffic operation – Traffic engineers and administrators are just beginning to tap the possibilities offered by applying modern communications and high-speed computer techniques to traffic operation and control.

Several cities are now using radio-controlled traffic signals to smooth traffic flow. Michigan is using closed circuit television for surveillance of expressway traffic; field detectors automatically transmit data to computers that instantaneously give traffic density, volume and speed.

Ohio is establishing one section of highway as an "electronic proving ground" where new devices and techniques can be tested and the results evaluated.

Toronto officials report a 20% increase in traffic volumes as a result of the pilot operation of traffic signals controlled by a centrally located digital computer. In this system, a vehicle detector counts traffic approaching an intersection and transmits the count to the computer; every two seconds, the computer measures the flow and adjusts the red-green pattern.

But whatever the marvels of electronic design, it takes big, rugged construction equipment to build the roads. For developments in equipment and methods over the past five years—and for what lies ahead—please turn to p. 74.

4 Equipment

Equipment Is Bigger and Better

POWERFUL MACHINES dominate the highway construction scene.

Machines form the rugged backbone of highway construction. Large or small, all-purpose or highly specialized, they play a part in efficient and economical roadbuilding.

Spurred by rough competition, equipment manufacturers continually improve their machines and develop new ones. They make them larger, faster, more powerful, more versatile, more compact, more productive, more precise, and easier to operate and maintain. And they make possible more work with less manpower and at essentially stable unit bid prices.

Equipment manufacturers have taken giant strides in the five years since the launching of the accelerated highway program.

And even greater changes lie ahead, according to some 50 major U.S. equipment firms who replied to an Engineering News-Record questionnaire. Here's what they see in the crystal ball:

- Radically new power plants. Coming fast is the small gas turbine (horsepower range up to 1,500), now in production by one manufacturer and under development by several others. Other possibilities are the fuel cell and special rotary engines. In the future, atomic and solar power.
- Greater use of individual electric wheel drives. Coupled with the new power plants and dependant on technical developments in electrical systems, will come all-wheel electric drives, doing away with conventional power transmission systems on some types of equipment. Hydrostatic drives may also be more common.
- Automatic controls, simplified operation. More and more automation is on the way. Automatic controls, already here for graders, will be extended to pavers and earthmoving equipment. Some day a fleet of earthmoving equipment may be operated by remote control from a central tower. Batching plants, already highway automatic, will be more so. Solid-state electronic controls are on the way. And continuous metering of ingredients for for portland cement concrete may come.
- Larger units, more specialized equipment. Demands for greater capacity will lead to even larger machines, particularly for earthmoving. In contrast, several manufacturers see increasing use of smaller, more versatile units. All agree that machines must become stronger, more durable and more efficient. Some see uses for a broader range of attachments for basic machines. More units will be self-propelled.
- Integrated, single-pass machines. Still in the distant future is the machine that rumbles over open country and spews out a completed highway behind. But several manufacturers see more machines coming closer to that goal. And some of them may use thermal or sonic energy to clear and disintegrate rock formations, create and surface roadbeds as durable as a volcanic formation.
- Ultrasonic techniques. Definitely around the corner are ultrasonic blasting and rock crushing. Rock drilling by jet piercing is on the way, too.
- Greater portability. Already highly developed, batching plants will become even more portable, with emphasis on speed and ease of erection.

Because a look at the past is one way to see the future, here are major changes that have taken place in the last five years, plus some more peeks at the future:

- **Excavation and earthmoving**—Excavators, earthmovers and hauling units have increased in size, capacity, power and versatility since 1956, when the curren burst of roadbuilding began.

Use of high-strength, light-weight steels and other metals has decreased machine weights. Combined with increased engine power, this factor has brought about more favorable payload-weight ratios.

Vital in increasing productive capacity were transmission improvements, including the widespread use of power shifts and torque converters. Designers focused attention upon many individual components and systems; hydraulic systems were improved markedly.

Engineers also concentrated on simplified maintenance, primarily through improved engine filters, lifetime lubrication and packaged assemblies of major components.

Engineers broke barriers to—

- Extend the use of integral hydraulic rippers. The companion development of shallow seismic exploration brought about ripping of many deposits previously blasted.
- Increase crane lift capacities and reach. And rail-mounted tower cranes are catching on in this country.
- Renew interest in tandem scrapers. And contractors are using very large amounts of power to push-load scrapers.

- Develop the large rubber-tired tractor to a full-blown heavy construction tool.
- Provide automatic slope control on motor graders.
- Develop land clearing and land leveling equipment; new configurations for bulldozer blades; better explosives, drills and bits; improved air compressors, including the rotary screw type; and many other items. Crawler tractors have improved suspension systems, hydraulic drives and higher speeds. And progress is being made toward interchangeability of excavating and hauling units. Tires designed for specific applications are in use and more are coming.

• **Concrete paving**—Manufacturers (and contractors) came up with these four major developments in concrete paving during the last five years:

- The slip-form paver, which came into prominence almost simultaneously with passage of the 1956 act. Now its use is found to be comparatively widespread.
- Central mixing of concrete. Developments in large tilting drum mixers and agitator truck bodies have stimulated use of centrally mixed concrete for highways, particularly in Ohio. Ready-mixed concrete transported in truck mixers is in demand for roads and bridges in urban areas.
- Highly portable and compact batch plants with automatic controls. A gradual evolution is bringing these plants to a level of sophistication and convenience not achieved before.
- The tri-batch paver. This triple-drum, nearly automatic machine is replacing dual-drum pavers on some large, high-production projects.

Other notable improvements include those in vibrating screeds and internal vibrators; joint devices and installation procedures; self-propelled spray curing machines; hydrostatic drives for truck mixers; and remote control hydraulic batch truck dump trippers.

And what of the future? Here's what one authority says, "We look to increased use of cement-treated subbases, central mix paving, slip-form pavers and increased rates of paving production."

• **Asphalt paving**—Two major changes in asphalt paving equipment mark the last five years. One is the rapid development of automatic controls for asphalt plants, both portable and semi-portable. Manufacturers are competing to produce highly automated, high capacity plants with greater mobility and speed of erection.

The other is the emergence of the self-propelled pneumatic roller for compaction of asphalt pavements. One manufacturer last year introduced a roller of this type in which tire pressures can be changed "on-the run."

In the Future —
What to Look for in Equipment.

- **Radically new power plants**
- **More electric wheel drives**
- **More automation**
- **Integrated single-pass machines**
- **Ultrasonic blasting**

Asphalt pavers now have greater speeds than five years ago; some are capable of speeds up to 100 ft per min. Manufacturers are field testing pavers with automatic controls for line, grade and cross section. The pneumatic-tired paver has found increasing use.

For surface treatments, seal coats and similar types of construction, improved spray bars on bituminous distributors are a significant step forward. And manufacturers have introduced single-pass seal coating machines, which apply stone chips immediately after the asphalt is applied.

There is a greatly improved unit for rehabilitation of asphalt surfaces; the machine performs three separate functions—heating, levelling and compaction. An infra-red joint heater fueled by propane is used as an attachment to a paver to improve quality of the longitudinal joint.

Emphasis in the next few years will be on additional automation, greater capacity, more durable components and fully integrated plants in which each major unit is utilized most efficiently.

• **Aggregates, bases and compaction**—Principal improvements in aggregate producing equipment are more capacity and portability. In the past five years, manufacturers have developed portable plants with capacities as high as 700 tons per hour.

Coming are better systems for hydraulic classification of aggregates and for economical removal of lighter materials from aggregates to bridge the gap between aggregate washing and heavy media separation.

Says one manufacturer, "Availability of suitable roadbuilding aggregates is decreasing annually. Means must be developed for producing paving materials from locally available soils and aggregates not now considered suitable. Compaction of both granular and plastic material must and will be materially improved."

Another says, "Chemistry will play a most important part in road construction—perhaps to the extent that high load bearing values can be produced without, or at least with minimum, compaction."

More and more contractors use central plants for the production of stabilized base course materials. Aggregate spreaders have shown little change, with emphasis on self-propelled units.

Compaction of granular materials has undergone a revolution with the introduction of vibratory compactors. Self-propelled tamping rollers are now in use, as is a vibratory sheepsfoot roller.

Contractors are using more and more segmented and grid-type rollers. They are using heavy pneumatic-tired rollers for compaction and—increasingly—for proof rolling.

Manufacturers have developed various combinations of pneumatic, steel-wheel and vibratory rollers.

Tractor loaders are bigger, faster and more powerful. Their use in materials handling and excavation is widespread.

• **Other equipment** — Manufacturers have improved many other types of equipment used in highway and bridge construction. Development of hydraulically extensible boom cranes continues.

Diesel pile hammers are in common use. And one manufacturer predicts all pile hammers will be internal combustion units in the future.

Pumps will not change much, but power for them will. Electrical submersible pumps may become more important in dewatering.

And as the equipment of roadbuilding keeps improving, so, too, do the materials. Please turn to p. 74 for the final article in this report.

Materials Improve With Highways

Sparked by the greatly increased demand of the past five years, producers of roadbuilding's five most widely used materials—steel, portland cement concrete, asphalt, aluminum and mineral aggregates—have improved their products.

And a newcomer to the field—the epoxy resin compound—has grown from infancy to a lusty youth since 1956.

Bridge designers have moved swiftly to take advantage of technological improvements in materials. And highway designers, constructors and maintenance engineers are using the latest materials to produce better roads at lower cost.

Here are major developments of the past five years for each of the key materials—plus a look at the future of each:

• **Steel**—The development and use of high-strength alloy steels ranks first for this material.

Producers made high-tensile bolts and plates available first. High-strength bolts replaced rivets in many steel structures, including some bridges. Designers realize weight and cost savings by selective use of the alloys in built-up structural members for bridges. And now U. S. Steel has begun production of rolled structural shapes made from high-strength, quenched and tempered alloys.

Desire to save weight has lead to more advanced concepts, including plastic design, orthotropic plate decks and an increasing number of composite structures. Engineers are designing more welded bridges. And now under construction in Iowa is a prestressed steel bridge of revolutionary design.

Steel continues to find wide usage in highway "hardware"—signs and sign supports, railings, light standards and fencing. Redefined concepts have made possible the use of lighter gage corrugated steel in pipe and arch culverts.

• **Portland cement concrete**—Since 1956, engineers have effected little change in the basic properties of concrete and its ingredients. Air entrained concrete—developed much earlier—is now standard for roads and bridges. And engineers selectively use various additives to control its behavior and properties.

Designs reflect a trend toward more use of reinforced concrete pavement, particularly for heavy traffic. Continuously reinforced pavements are still under study. Prestressed pavements—on the rise in Europe—have not yet found acceptance in the U. S., because of high initial cost.

Engineers continue to study pavement jointing; sewed joints are standard, but some new joint devices have found favor in some states.

Use of precast and prestressed concrete for bridges increases every year. Last year, contractors completed the Lake Oneida Bridge, which incorporates the longest prestressed concrete clear span in the U. S. (320 ft). And bridges miles long have been built in Louisiana and Florida with repetitive sections incorporating prestressed piles and deck units.

• **Asphalt**—Big emphasis here is on the design and construction of more stable, durable and economical hot-mix asphalt pavements. And progress toward this goal is steady.

A break-through may be near in specifications for asphalt cement. Empirical tests soon may be replaced by standard methods of measuring kinematic viscosity. And temperature-viscosity curves are being used more widely to control mixing temperatures of asphalt-aggregate combinations.

An Asphalt Institute engineer lists these important improvements of the last five years:

1. Standardizing of asphalt mixtures.
2. New drainage concepts.
3. Use of full-width paving to control surface water.
4. Development of asphalt curbs and dike construction for control of surface water.
5. Revival of use of asphalt base courses.

Engineers have introduced additives into asphalt mixes, principally on a trial basis. Newer ones include neoprene in New Jersey, latex in Massachusetts, asbestos in a number of states, and hydrated lime.

Cationic emulsions are said to be better than previously available asphalt emulsions. Contractors in the Midwest are laying foamed asphalt pavements, in which a controlled amount of water is introduced during mixing.

• **Aluminum**—Engineers choose aluminum for many highway uses, including signs and sign supports, bridge railings and light standards. Manufacturers are now producing aluminum sheets for fabrication into culverts.

And aluminum is emerging as a structural material. Small aluminum girder bridges are now in service. Under construction in Virgina and getting started in both New York and Maryland are bridges that use structural members made of aluminum sheet.

• **Aggregates**—Emphasis in the last five years has been on more demanding grading specifications and the upgrading of local aggregates that previously had been thought to be unsatisfactory for road construction.

Says one consulting engineer, "A major problem facing roadbuilders today is changing specification requirements with a higher percentage of fines, as in base materials produced from rock and the percentages of crushed particles in crushed gravel."

Portland cement, asphalt, mineral aggregates, chlorides and lime continue to be major soil stabilizing agents. A symposium at the Highway Research Board meeting in January reported work done with phosphoric acid for soil stabilization.

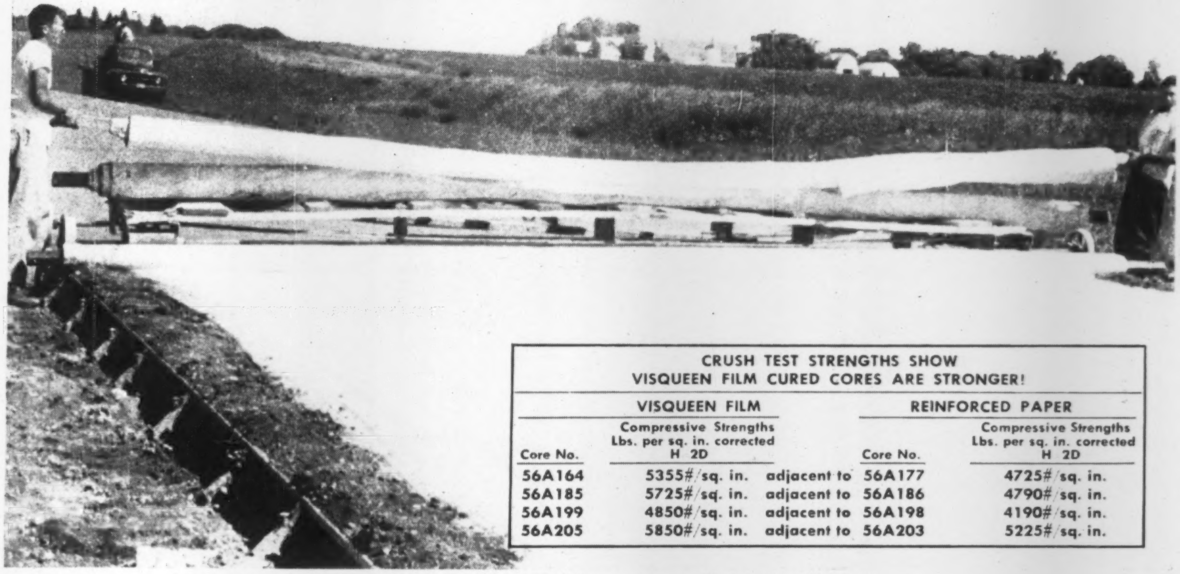
• **Epoxies**—Current glamor products of the highway business are the epoxies. Construction and maintenance engineers use them to join, seal, patch and coat many construction materials. Properly formulated and applied, the compounds have good adhesion, chemical resistance and toughness; and they cure rapidly.

As adhesives, they bond precast concrete sections together, traffic bars or buttons to pavements, thin overlays to existing concrete pavements, steel dowels to concrete, and curbs to pavements.

Mixed with aggregates, they form excellent mortars for repairs to pavements, bridge decks and other structural components. Their speed of curing makes them ideal for emergency of under-traffic repairs. Large quantities of an aggregate-epoxy mortar are being used to bond together pontoons in the Hood Canal floating bridge in Seattle.

Technical developments with these materials are rapid. In the future lies the use of structural members made of epoxy compounds.

And if these past five years of roadbuilding on the Interstate prove anything, they prove that in the engineering, the construction of roads these days —the future comes fast.



CRUSH TEST STRENGTHS SHOW VISQUEEN FILM CURED CORES ARE STRONGER!				
VISQUEEN FILM			**REINFORCED PAPER**	
Core No.	**Compressive Strengths Lbs. per sq. in. corrected H 2D**		**Core No.**	**Compressive Strengths Lbs. per sq. in. corrected H 2D**
56A164	5355#/sq. in.	adjacent to	56A177	4725#/sq. in.
56A185	5725#/sq. in.	adjacent to	56A186	4790#/sq. in.
56A199	4850#/sq. in.	adjacent to	56A198	4190#/sq. in.
56A205	5850#/sq. in.	adjacent to	56A203	5225#/sq. in.

Core strength tests show results obtained with VISQUEEN film curing blankets.

"VISQUEEN" FILM GIVES STRONGER CURES WITH GREATER ECONOMY

TRADEMARK

LOW FIRST COST—plus as many as 23 re-uses cut blanket costs to a fraction of a cent/sq. ft.

LOWER LABOR COSTS result because white opaque VISQUEEN film is far lighter, hence easier, more speedily handled. 1000 sq. ft. of .004″ thickness weighs 20 lbs. And white opaque VISQUEEN film curing blankets *stay* light. Will not absorb moisture.

TIME SAVING: When using VISQUEEN film curing blankets, additional watering is not necessary. The film rolls up easily—needs no drying or special handling. Will not rot or mildew. Inert—no chemical reactions with concrete—leaves no deposit on slab.

ONLY VISQUEEN film comes in standard widths—or blankets—*seamless* widths up to 32′. Available in 14′ roll widths with no folds.

ADDITIONAL USES of VISQUEEN film: rain blankets, equipment and material covers.

Write now—or use the information request tag below for full information on how VISQUEEN film can do your job better at less cost.

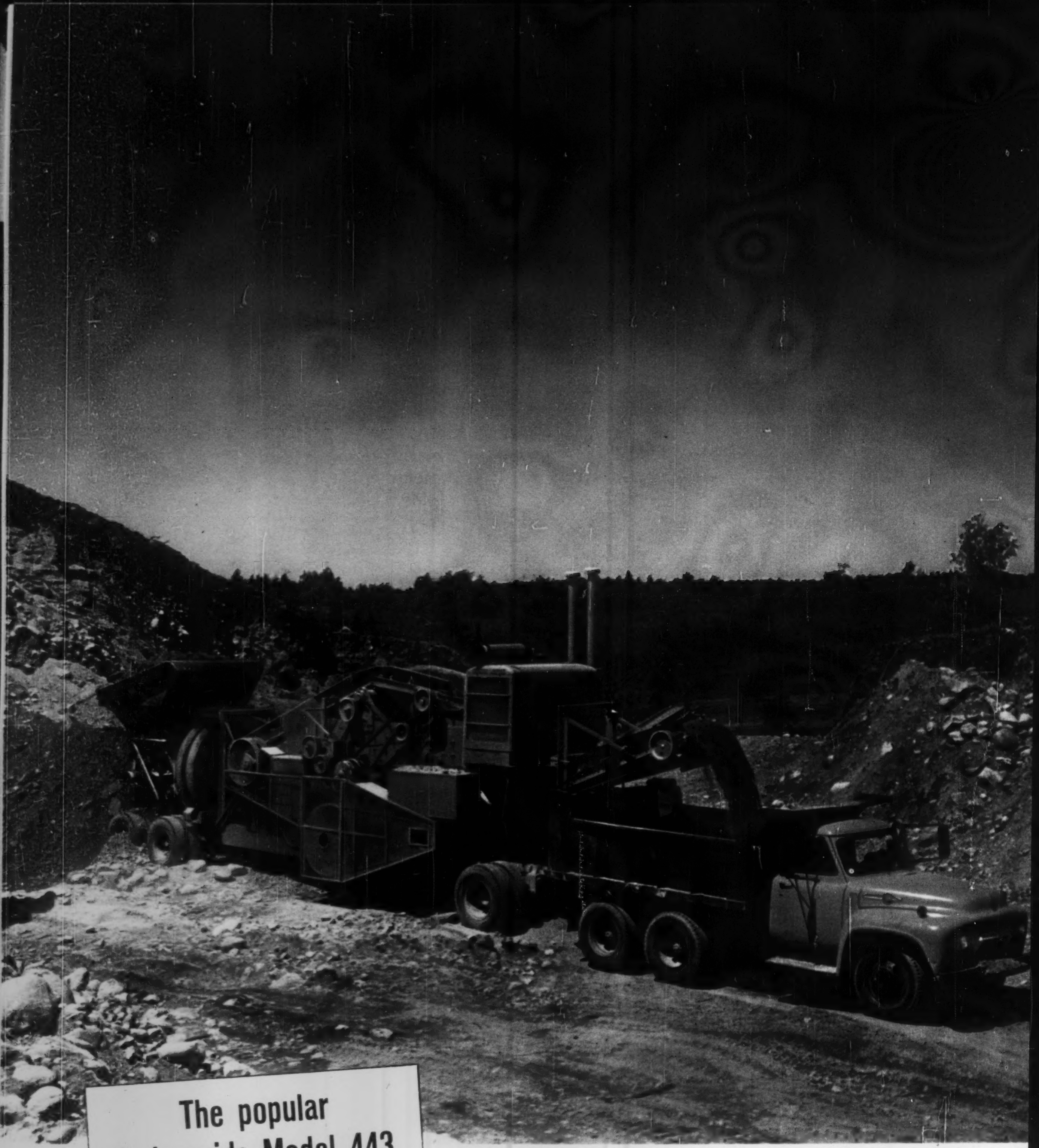
Information request tag
VisQueen
Trade Mark
clip this tag—#EN6
attach to letterhead, mail.

VISQUEEN *film—the first and foremost polyethylene film. A product of the long experience and outstanding research of Special Products,* **VISKING COMPANY** *Division of* UNION CARBIDE *Corporation*
6733 West 65th Street, Chicago 38, Illinois.

In Canada: Union Carbide Canada Limited, Visking Division Toronto, Ontario, Canada.

VISKING and VISQUEEN are trademarks of Union Carbide Corporation.

CIRCLE 75 ON READER SERVICE CARD



The popular Cedarapids Model 443 SENIOR COMMANDER

When the first Cedarapids Commander crushing and screening plant was designed, it was an immediate success for high-production, low-maintenance performance. Thousands upon thousands of tons later, the proven basic Commander design is still the most productive and profitable on the market. This is the design which has become the pattern for all portable front delivery tandem crusher plants in the new Cedarapids Commander Series line.

There's a profit-proved plant for your job in the

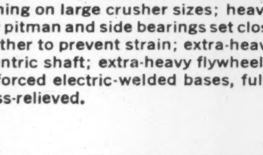
NEW CEDARAPIDS COMMANDER SERIES OF PORTABLE AGGREGATE PLANTS

● Now it's easier than ever to select the portable aggregate plant YOU need. Cedarapids has combined its broad line of front delivery tandem crusher plants into one *Commander Series* of 18 versatile models (some with semi-electric drives), from the Model 111 Pitmaster Commander to the Model 667 Master Commander. Capacities range from 50 tons per hour to 700 tons per hour.

Each of the 18 models is tailored to your particular needs through engineered variations in component sizes and types which can be combined as you wish to meet specifications in your local conditions. And best of all . . . in the Commander Series you'll find the plant that matches your equipment budget. Your Cedarapids Dealer has the details . . . see him today.

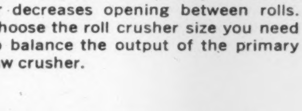
Continual improvements in proven basic Commander design and components give you these profit benefits

- 100% portability for quick moves. Horizontal screen always in operating position; nothing to raise, lower or adjust for traveling. Permanently mounted conveyors with self-cleaning pulleys speed set-up time. Optional third axle for large models to meet highway load limitations.
- High delivery discharge; no need to doze out driveway for big trucks.
- Easily accessible controls, centralized to give operator complete control and full visibility of all operations.
- Conveyors of the correct size and speed to handle high capacities without bottlenecks. Reinforced plant conveyor, self-cleaning pulleys, Iowa-built troughing rolls and idlers cut maintenance costs.
- Large, mono-rail return wheel easily handles high capacities. Adjustable paddles for handling different types of aggregate.



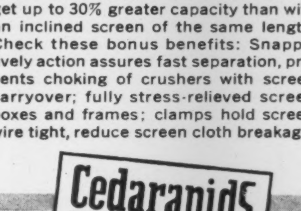
JAW CRUSHERS

Choose the size primary crusher you need, either Twin Jaw or Single Jaw types. Both have profit-boosting engineering improvements: Easy, simple hydraulic adjustment of discharge opening on large crusher sizes; heavy-duty pitman and side bearings set close together to prevent strain; extra-heavy eccentric shaft; extra-heavy flywheels; reinforced electric-welded bases, fully stress-relieved.



ROLL CRUSHERS

Designed to match high capacities of large screens and conveyors: Heavier than average bearings; exclusive feed design to utilize full width of rolls for crushing; higher speed operation (peripheral speed of roll, 500 fpm); patented shim adjustment quickly increases or decreases opening between rolls. Choose the roll crusher size you need to balance the output of the primary jaw crusher.



SCREENS

Cedarapids horizontal vibrating screens are engineered for extremely high capacity per square foot of screening area. You get up to 30% greater capacity than with an inclined screen of the same length. Check these bonus benefits: Snappy, lively action assures fast separation, prevents choking of crushers with screen carryover; fully stress-relieved screen boxes and frames; clamps hold screen wire tight, reduce screen cloth breakage.

Cedarapids

Built by IOWA

P1261N

IOWA MANUFACTURING COMPANY
Cedar Rapids, Iowa

←CIRCLE 76 ON READER SERVICE CARD

CIRCLE 77 ON READER SERVICE CARD

BORDEN
First IN FLOOR GRATING
ELIZABETH, N. J.

ENGINEERS — A New Installation Concept in Floor Grating!

Simplifies Maintenance, Lowers Total Costs

Now a new installation technique completely eliminates the need to anchor floor grating in place. This allows erection as fast as the structural steel support members are placed and bolted. The technique is only possible with a special reversible Borden Type K panel which will lie perfectly flat on supporting steel with no tendency to rock.

Furthermore, floor grating can now be installed and used for working and walking as quickly as the main structural members are erected. Two men can lift any panel in a matter of seconds for easy accessibility and maintenance.

BORDEN METAL PRODUCTS CO.

Gentlemen:

Please send new "Engineering Concept" folder.

NAME ....

TITLE ....

COMPANY NAME ....

ST. AND NO. ....

CITY AND STATE ....

CIRCLE 78 ON READER SERVICE CARD

THIS IS WORTH KNOWING ABOUT!

For complete information, write for technical folder entitled "An Improved Engineering Concept in the Installation of Floor Grating".

BORDEN METAL PRODUCTS CO.

"Greatest name in gratings"

815 Green Lane
Elizabeth 2-6410
Elizabeth, N. J.
Plants at: Union, N. J. — Leeds, Ala.
Conroe, Texas — Beeton, Ontario

ENR COSTS REPORT AND OUTLOOK

$
HIGHWAY
2ND
QUARTER

The Struggle to Turn a Profit

COST increases that ENR predicted in March have come to pass; still higher costs must be expected. That's the message you'll get out of the quarterly report that follows.

This report features highways and heavy construction, just as the first-quarter report in March featured buildings. Here you will find facts and figures on basic costs of highways, bridges and other heavy construction set forth to help you in the struggle to keep prices in line with costs—to keep a profit in construction.

You won't get very far into the pages that follow before you see that highway contractors are continuing to hold bid prices down in the face of steady increases in basic construction costs. It has been argued that the downtrend in highway bid prices is just as good for contractors as it is for highway buyers, the states and the federal government. For the cheaper the state gets a given piece of highway, the more it will have left to spend on another project. The number of jobs for contractors increases, goes the argument.

This is fine, as long as each job is bid so as to be profitable.

Increased volume and bargain bid prices force constructors to tune up their operations to turn in a profit. Field operations must be faster; overhead must be spread over more jobs; equipment must be maintained and scheduled for less down-time; management must be tightened all along the line.

With today's slim profit margins, you need more than your past experience and present knowledge of your business, your men and your machines. You must be ready to outwit the future. That means you must know what's going to happen to your costs. You'll find the information in the pages that follow.

Forewarned should be forearmed.

Where to Look . . .

• • • for the cost review and outlook

What's happened to basic costs in the past three months and what's ahead 80, 81

• • • for the indexes

Engineering News-Record's Construction Cost and Building Cost Indexes for 20 major construction centers, plus a roundup of other cost and price indexes 97

Highway Bid Price Indexes—showing how highway contractors' bid prices compare with their basic costs 82, 83, 92

Irrigation & hydroelectric project cost indexes 98

• • • for computer usage

A survey of state highway departments finds their use of computers increasing in bid evaluation and cost analysis 104

• • • for prestressed bridge costs

Consultant Schupack analyzes and plots the costs of major prestressed bridges in the U. S. 106

• • • for the four M's

Price trends updated for machines, materials, men, money 108, 109

Monthly materials price page—lumber, plywood, explosives, glass, chemicals 103

• • • for unit prices, price analysis

Highways:

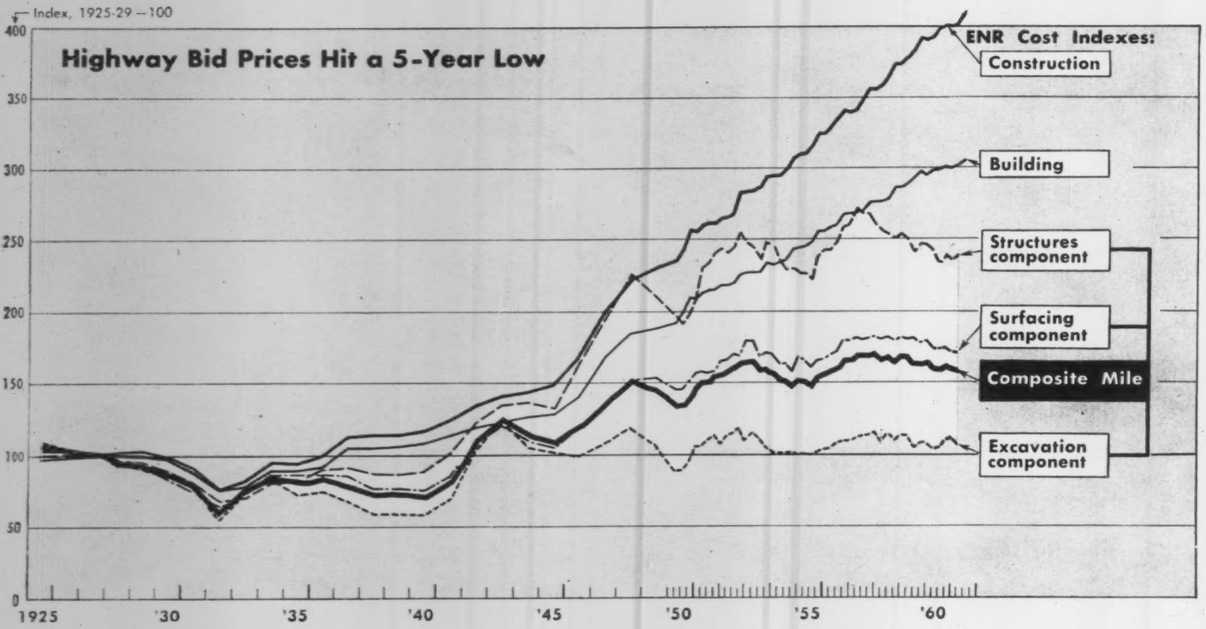
In the Far West and West of the Mississippi 84
In the Midwest and Middle Atlantic states . 88
In the South, and average unit prices for the U. S. 90
In Alaska 126
In New York 126
In Massachusetts 125, 126

Heavy Construction:

Yellowtail Dam and Powerplant in Montana 117, 121, 123
Cemetery relocation costs in Georgia and South Carolina 123
Colorado's NORAD excavation 130, 132, 134
Channel dredging on the Missouri River . . 134

Buildings:

Where the Building $ Goes 112
Where the Garage Building $ Goes 115



Bargain Bids Defy Costs Rise

Heavy construction contractors' costs and their bid prices continue to move in opposite directions. In the first half of '61, ENR's 20-cities Construction Cost Index, a monthly measurement of cost trends in the three basic construction materials (cement, lumber and structural steel) along with common labor wage trends, jumped 1.9% to an all-time high of 850.38. The index is based on average materials prices and wage rates in 1913 as 100.

In the same time, ENR's Building Cost Index, which measures materials prices and skilled labor costs in 20-major cities against a 1913 = 100 base, tacked on 1.2% to hit a record 570.17.

But the U. S. Bureau of Public Roads Composite Mile Index, which traces trends in bid prices on federal aid highway contracts let by state highway departments dropped 1.4% to a 5-year low of 158.7. The Composite Mile is based on average bid prices in 1925-'29 as 100. Compiled quarterly, the latest value covers first quarter '61.

The U. S. Bureau of Reclamation's Irrigation and Hydro Cost Index, unchanged at 1.26, showed that contractors' bid prices in this area, too, are being easily outdistanced by their basic costs. The BuRec index is based on average costs to the "buyers" of irrigation and hydro projects in 1949-51 as 100. Compiled every four months, the latest value covers January-April 1961.

But a look at the quarterly bid price indexes reported by state highway departments (pp 82-83) shows state by state variations. Of 12 such indexes, 7 rose in the first quarter while 5 declined. But when you look closer, it becomes evident that the effect of unusual conditions on particular projects bears much of the responsibility for increases in average bid prices. This is particularly true in the Western states, where difficult or dangerous conditions on highway work in mountainous areas can push up the price and completely distort the bid price average.

Examination of long-term trends in costs in relation to heavy contractors' bid prices show that since 1957, the basic cost of heavy construction, as measured by ENR's Construction Cost Index has gone up 18%. But take a look at the chart above and see what's happened to highway contractors' bid prices, as measured by the Composite Mile. They're down 7.1%. Contractors on irrigation and hydro projects have pulled their prices down, too, but not nearly so much. The BuRec index shows that their bid prices are down only 0.8% since 1957.

Still further increase in basic costs are on the way. So heavy construction men can't afford to relax their efforts to make sure their efficiency keeps pace with their costs.

The basic cost records set this month will not outlive this month. There are enough automatic wage increases under long-term contracts to insure that. Add to these, wage hikes under contracts yet to be negotiated (see p. 109) and higher prices for key construction materials and you've got the unpleasant picture of a steady cost uptrend over the next six months.

Here's the forecast in detail:

Labor—A 1.5% boost in ENR's average of wage rates contractors pay for common labor. By December 1, this average should stand at a record $2.879 per hour. In the same period, look for ENR's average of wage rates for the three basic skilled trades: bricklayers, carpenters and structural ironworkers to move up 1.1% to an average $4.245 per hour.

Materials—Cement prices will stay where they are, at an average of $4.04 per bbl of bulk Portland, fob ENR's 20-cities. As a matter of fact, the construction industry may, as in the past, be the beneficiary of the deepening struggle between truckers and railroads which could force rail freight rates for cement down in some areas.

But that's the only good news. Lumber prices should be higher by December. And contractors would be wise to figure on higher prices for structural shapes on any job they bid in the second half of this year.

These wage and price boosts could

shove ENR's Construction Cost Index 1.7% higher to 864.44 next December, while the Building Cost Index rises 1.5% to 578.91.

Construction men got a taste, in the first half, of what may happen to lumber prices later this year. The price rise which ENR forecast back in December got underway sooner than expected. Got underway is putting it mildly. Actually, lumber took off like a scalded cat. Between January and April, West Coast mill prices of bellweather green Douglas fir 2x4s jumped 12%. And the larger dimensions posted as spectacular an advance. Fir 2x8s also rose 12% and 2x10s 13%. Much of this blistering advance was due to buying by wholesale lumber dealers, speculating on a much more dramatic economic recovery than we have seen so far. Since April, the market has given up about half of the ground it gained. But there is enough demand for lumber at current prices to suggest that it wouldn't take much to shove the market back to the April highs. Passage of President Kennedy's housing bill in anything like its present form could do the trick (ENR June 1, p 72).

Beyond question, the most important piece of cost news this year would be a rise in steel prices. Even the steady advance in construction labor costs would have to take a second place to the long-range inflationary effects of higher steel prices. A boost in structural shape mill prices would force the ENR cost indexes up, of course. But higher prices for other steel items would be felt in a variety of things that contractors must buy, construction equipment for example. And worst of all, higher steel prices could shift the consumer price escalator into higher gear, giving labor unions powerful ammunition in next year's negotiations.

In December, 1960, the steel industry withstood the second wage jolt under the contract which ended the great strike. The price line was held then. But ENR forecast that the third and last wage hike, slated for October '61, wouldn't pass without a price boost of $3.60 a ton for standard structurals. That forecast still stands.

Leaders of this traditionally close-mouthed industry are quite open in stressing the need for a price increase to offset their labor costs. For example, Avery C. Adams, chairman of the board of Jones & Laughlin Steel Corp., says that no basic industry can withstand increasing labor costs "as the steel industry has done . . . and will do again . . . without either a compensating price increase or inadequate profits." Thomas F. Patton, president of Republic Steel Corp., says that "We must have a price rise . . . if we are to have a reasonable profit." And Bethlehem Steel Corp.'s president, E. F. Martin, says that steel prices will have to be increased if companies are going to make enough to pay for modernizing their plants. Before this can be done, "the steel industry will have to get a little more business," he adds.

There isn't much doubt that "a little more" steel business is on the way. In fact, Harold C. Lumb, vice president of Republic Steel Corp., predicts that steel production in the next 12 months will approach the record output of 117 million tons in 1955. He looks for ingot production to be in the neighborhood of 2.2 million tons by the fourth quarter of this year and 2.4 million tons in the first half of next year.

Steelmen look for inventory replenishment to add vigor to the demand for steel. They point out that as the mills get busier they will lose the ability to make the very rapid deliveries that steel users have been able to count on this year. When that happens, customers will have to step up their ordering if they are to maintain their minimum steel inventory needs.

Construction, particularly industrial work, will add muscle to steel demand in the second half. Industrial building contracts, reported by ENR, surged in April and May, bringing the five-month '61 total to $1.3 billion, a 25% jump over January-May 1960.

There are several factors which could weigh against a steel price boost. Competition from foreign steel can't be ignored. And other industries, such as concrete and timber, are stepping up research programs to develop new products and applications aimed at making inroads into steel's position in construction.

Furthermore, steel men will have to consider the attitude of the U. S. Department of Justice towards any price hike. Attorney-General Robert F. Kennedy says that he is "concerned" about "price leadership." And while he didn't single out the steel industry, it isn't likely that he'd ignore a repetition of the pattern which prevailed the last time steel prices were raised, in 1958. Then, the industry fell into line within hours after U. S. Steel hiked its mill prices.

While these arguments against a steel price increase remain, there are, unfortunately, enough factors on the other side to make it imprudent for contractors to ignore the possibility that they'll be paying more for steel by the end of the year.

There is a bright spot, however. Even if steel prices do go up this year, the construction industry's over-all steel cost may be held down by new engineering concepts employing less steel more efficiently. These are based on new, lighter, high-tensile-strength steels which the mills have developed to improve their competitive position with other materials.

A good example of the cost-cutting potential of these new steels is a 25.8% ($45,000) saving in the cost of steelwork on the new 40-story United Insurance Co. of America building in Chicago (ENR May 4, p. 22). Not only did higher yield point steels make it possible to use less steel and use it more efficiently, but smaller columns were possible, opening up more usable floor space and cutting cost of fireproofing.

Cost savings like this have been accomplished with steels with yield points up to 100,000 psi, three times that of ordinary steel. Steels with yield points as high as 300,000 psi may soon be available. And the increase in price is not expected to be proportionately as large as the yield point increase, thus making the new steels economical.

Another steel cost-cutting development is U. S. Steel's commercial production of rolled structural shapes made from high-strength, quenched and tempered alloy steels (ENR May 25, p. 13).

Long-term money costs appear to be confirming ENR's forecast that the year's low point would come in the second quarter (ENR March 23, p. 59).

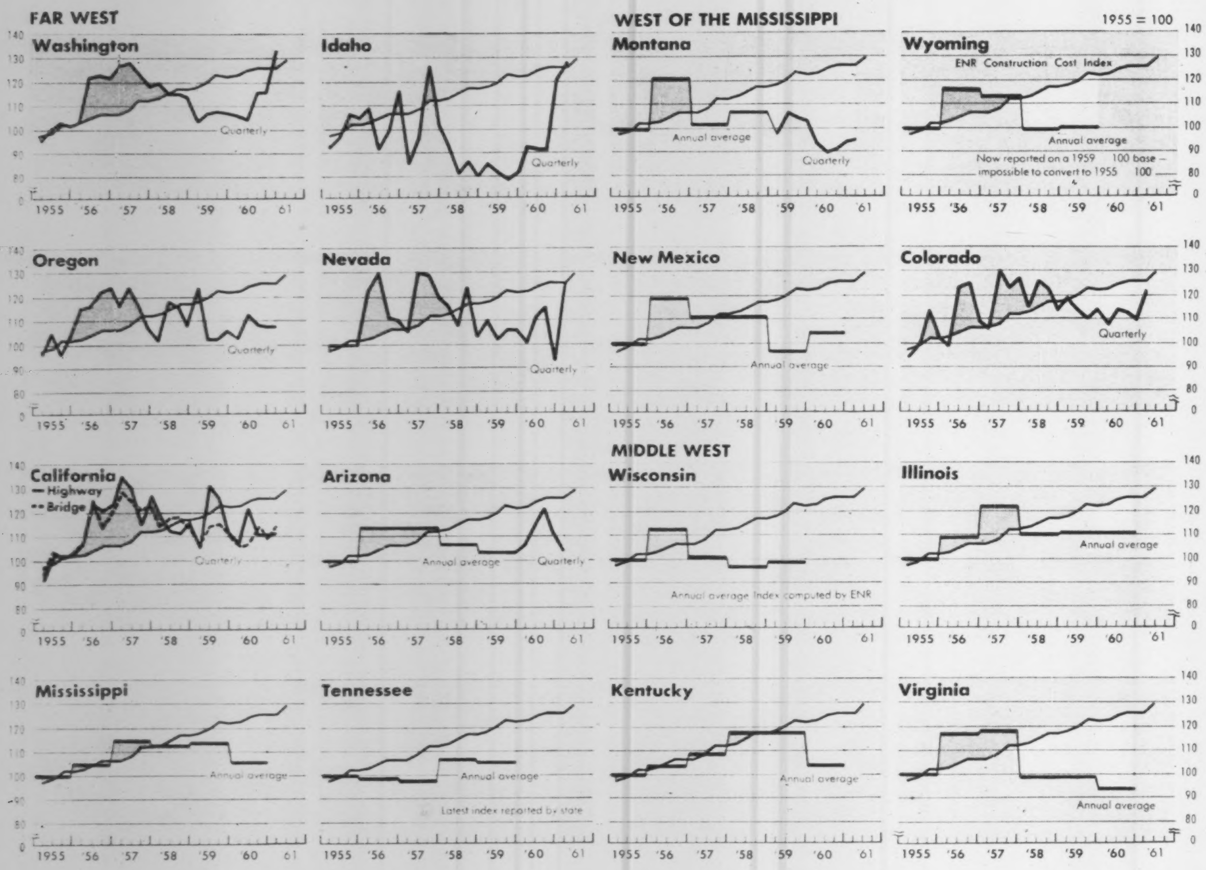
Administration efforts to cut long-term interest rates by Federal Reserve Board open market purchases of government bonds won somewhat unenthusiastic support from the Fed and was greeted with extreme skepticism by the financial community. Fed buying did play a role in pushing long-term treasury bond prices high enough in May to trim yields to the lowest level since September 1960. Interest rates on high-grade municipals were held down by the lower treasury yields. But rates for top-quality industrial bonds kept edging up as demand for money increased with the economic recovery.

In June, the treasury bond market took a slide, carrying yields almost back to where they were before the Fed stepped in. Municipal yields took this as a cue to reverse their downtrend. And yields on industrials accelerated their climb.

You can expect long-term money costs to keep on rising, with some hesitation, for the rest of the year.

President Kennedy has certainly not given up his fight for easier money. But the decision of the market place is that the fight is lost.

Highway Bid Prices Trail



Highway Bid-Price Indexes

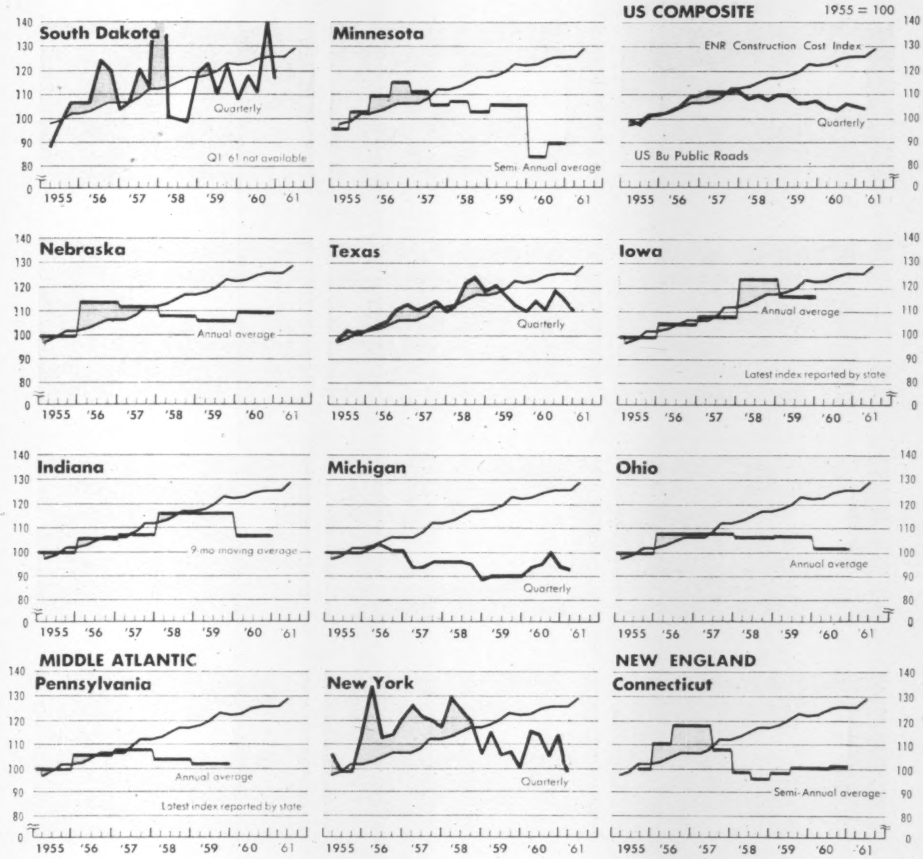
Reported by State Highway

Region:	FAR WEST							MISSISSIPPI TO THE ROCKIES							
State:	Wash.	Idaho	Ore.	Nev.	California		Ariz.	Mont.	N. Mex.	Wyo.	Colo.	S. D.	Neb.	Texas	Minn.
Base yr:	1940 b	1950	1940	1955	Hwy. 1940	Bridge '39–'40	1940	1950	'57–'59	1959	1949	1940	'37–'41	'49–'53	1940
1940	100.0	....	100.0	....	100.0	99	100.0	....	43.8	...	....	100.0	93.2	....	100.0
1946	163.0	....	155.9	....	179.7	182	186.0	....	77.9	...	....	177.6	162.4	....	147.1
1949	214.5	....	181.1	....	190.7	201	198.8	....	77.5	...	100.0	217.0	207.1	89.8	160.0
														97.3	148.5
1950	169.2	100.0	170.8	....	181.2	202	165.9	100.0	90.9	...	82.2	176.3	191.3a	104.0	185.3
1952	204.5	96.9	202.3	....	225.9	235	228.4	90.4	107.6	...	101.5	212.6	231.6	102.7	175.8
1953	208.3	114.2	182.0	....	215.3	229	214.1	84.3	106.8	...	87.7	197.1	223.8	96.3	174.9
1954	189.8	95.9	168.5		193.5	219	193.3	75.3	92.9	...	82.8	168.6	204.4	97.0	188.8
1955	181.9	113.3	162.3	100.0	205.7	228	190.9	86.6	93.9	...	81.4	177.0	212.2	105.0	211.4
1956	214.1	118.3	193.8	118.2	247.3	265	217.8	104.8	111.9	...	92.8	198.8	241.1	100.6	207.8
1957	226.4	116.1	187.8	124.3	264.3	283	218.4	88.2	104.5	...	97.3	205.6	237.7	107.4	209.3
1958	**211.4**	**96.4**	**180.1**	**113.3**	**236.5**	**267**	**203.4**	**92.5**	**104.3**	**83**	**96.1**	**184.5**	**229.8**	**109.2**	**H 1:**
Q 1	217.7	105.8	166.1	117.2	241.8	259	204.9	....	....	...	93.7	179.6	....	118.7	201.2
Q 2	210.1	92.1	190.8	108.0	231.0	268	189.0	....	....	...	102.5	177.1	....	120.8	H 2:
Q 3	211.0	97.0	188.7	124.2	228.5	268	216.2	....	....	...	99.9	175.9	....	115.2	194.9
Q 4	206.6	90.5	174.9	103.3	238.5	259	207.7	....	....	...	92.7	209.8	....	....	....
1959	**194.0**	**93.6**	**176.3**	**104.6**	**239.7**	**260**	**198.7**	**89.0**	**90.9**	**100**	**92.9**	**200.7**	**224.2**	**111**	**200.9**
Q 1	189.0	97.2	201.4	110.0	216.1	245	197.0	85.3	....	...	97.2	216.9	....	117.0	H 1:
Q 2	194.6	92.5	165.4	102.4	270.4	260	198.4	91.4	....	...	92.5	194.1	....	112.1	205.0
Q 3	196.9	89.3	165.4	105.7	260.3	262	214.9	90.0	....	...	89.3	215.5	....	108.4	H 2:
Q 4	195.4	93.0	172.8	106.2	229.1	253	184.8	89.0	....	...	93.0	191.2	....	106.5	196.7
1960	**a**	**a**	**175.4**	**112.4**	**232.5**	**250**	**a**	**81.1**	**98.0**	**78**	**90.3**	**a**	**231.1**	**110.4**	**a**
Q 1	192.8	103.8	167.3	101.2	219.8	240	203.9	80.6	....	...	88.1	208.2	....	110.9	H 1:
Q 2	190.1	103.6	182.7	111.0	251.6	245	218.7	78.0	....	...	92.8	195.8	....	106.0	177.7
Q 3	210.7	102.7	176.4	115.6	229.1	258	231.7	78.8	....	...	92.3	247.5	....	114.6	H 2:
Q 4	212.0	136.8	175.5	93.5	228.5	248	213.1	81.1	....	...	89.3	207.3	....	111.5	190.6
1961															H 1:
Q 1	242.9	145.3	175.2	125.9	229.6	260	199.6	82.5	....	...	99.7	N A	....	116.0	195.1 est.

***a Official yearly average not released by state. *b The quarterly indexes up to 1961 are on an accumulative basis and are therefore distributed over the entire year. The index for the first quarter of 1961 is on a non-accumulative basis and so is a true index for the quarter.**

Costs Roundup—2nd Quarter

Behind Contractor s' Costs



HOW BID-PRICE CONSCIOUS the State Highway Departments are is illustrated by the number that maintain their own bid price indexes—over 30 of them. Additional states keep an eye on bid price averages and ranges, but do not convert them to index form. Seventeen states have put their bid price indexes on electronic computers.

Composite miles are the weighting system in four or more states, others reprice total representative base-year quantities, some half dozen set percentage weightings for the components selected for pricing.

Kansas computes seven component indexes but does not issue a composite series. Eight other states compute component indexes in addition to their composite series. Eighteen states show the component prices used for computing their highway bid price indexes.

The number of components priced ranges from three to 20. Most of the states use carefully weighted price averages, some states discard extremes.

Departments and the U. S. Bureau of Public Roads

Region:	MIDWEST					SOUTH				MID-ATLANTIC		NEW ENGLAND		U. S.
State:	Wis.	Ill.	Ind.	Mich.	Ohio	Miss.	Tenn.	Ky.	Va.	Pa.	N. Y.	Me.	Conn.	Composite
Base yr:	1955 e	'37-'41	1953	1940	1955	'37-'41	'35-'40	'38-'41	'37-'41	1940	1940	'37-'40	1939	1940
1940	.....	91	.....	100.0	47.7	100.4	94.0	99.3	95.8	100	100.0	...	93.9	100.0
1946	.....	142	.....	155.8	78.7	163.4	184.7	172.2	198.9	171	162.8	104	170.1	166.1
1949	.....	162	.....	149.0	86.3	182.7	199.9	190.3	203.6	193	202.8	148	184.6	203.6
1950	.....	158	.....	151.5	91.4	175.5	203.2	184.3	190.8	192	175.4	153	177.9	192.4
1952	.....	195	.....	177.0	103.0	227.4	211.8	213.9	258.4	205	207.5	195	226.7	226.9
1953	.....	192	100.0	178.8	107.1	186.8	213.4	206.8	226.2	209	245.8	170	219.0	223.7
1954	.....	187	86.5	168.0	102.0	195.0	198.7	196.0	203.8	208	240.6	179	222.9	211.1
1955	100.0	179	86.9	181.9	100.0	180.7	202.6	202.7	223.4	199	214.8	171	243.9 d	213.4
1956	112.8	195	91.9	185.4	112.7	190.0	200.1	210.0	261.3	211	252.2	182	279.6	228.1
1957	101.3	218	93.2	173.0	109.4	207.7	199.1	221.2	262.7	214	268.5	169	276.3	237.5
1958	**97.4**	**196**	**101.1**	**171.1**	**105.4**	**203.9**	**216.7**	**239.6**	**222.2**	**206**	**257.2**	**188**	**236.8**	**233.9**
Q 1	.....	...	.....	175.0	.....	.....	.....	.....	209.5	...	277.1	...	.....	233.4
Q 2	.....	...	.....	.....	.....	.....	.....	.....	236.1	...	266.8	...	239.9 c	235.3
Q 3	.....	...	.....	172.7	.....	.....	.....	.....	230.3	...	257.5	...	.....	231.4
Q 4	.....	...	.....	162.7	.....	.....	.....	.....	226.7	...	227.3	...	233.6 d	235.3
1959	**99.4**	**198**	**101.1**	**163.7**	**106.2**	**206.0**	**214.7**	**238.5**	**220.5**	**203**	**230.3**	**161**	**242.1**	**229.9**
Q 1	.....	...	.....	163.0	.....	.....	.....	.....	212.4	...	246.7	...	.....	234.1
Q 2	.....	...	.....	164.1	.....	.....	.....	.....	201.1	...	226.8	...	239.2 c	227.8
Q 3	.....	...	.....	163.8	.....	.....	.....	.....	276.7	...	229.6	...	.....	228.2
Q 4	.....	...	.....	163.2	.....	.....	.....	.....	217.0	...	217.9	...	245.0 d	229.6
1960	.....	**198**	**92.8 b**	**174.4**	**102.1**	**191.4**	**N A**	**210.4**	**206.7**	**f**	**237.3**	**155**	a	**224.3**
Q 1	.....	...	.....	170.8	.....	.....	N A	.....	214.6	...	246.3	...	.....	223.3
Q 2	.....	...	.....	174.5	.....	.....	N A	.....	224.2	...	244.3	...	243.87 c	222.2
Q 3	.....	...	.....	183.8	.....	.....	N A	.....	196.9	...	226.3	...	.....	227.1
Q 4	.....	...	.....	171.1	.....	.....	N A	.....	226.5	...	242.2	...	245.84 d	224.4
1961														
Q 1	.....	...	.....	169.3	.....	.....	N A	.....	202.3	...	211.1	...	.....	221.6

•a Official yearly average not released by state •b 9-month moving average, ending Dec. 31, 1960 •c June •d December •e State does not compute bid price index. Indexes shown were computed by ENR from average unit prices and quantities. •f Index not compiled by state in 1960

Highway Average Unit Prices

FAR WEST

Bids for 1st quarter '61 highway work in Nevada showed a consistent increase pattern. Every item in Nevada's bid price tabulation was above its 1960 average. Biggest jump came in borrow bid prices, 93% over 1960.

Arizona was at the other extreme. Bids for seven out of eight selected work items were below March-June 1960.

Wherever a state does not report an official 1960 average, comparison is made with the second quarter, which is generally the most representative part of the highway construction year.

Washington

	Unit	1954	1955	1956	1957	1958	1959	1960	Q1 1961
Excav., common	cy	$0.298	$0.288	$0.283	$0.297	$0.270	$0.230	$0.260	$0.390
uncl	cy	0.419	0.370	0.470	0.400	0.420	0.420	0.470	0.640
solid rock	cy	0.954	0.710	1.467	1.742	1.360	1.11	1.26	1.75
Ballast	t	0.939	1.170	1.306	1.080	1.180	1.100	1.160	1.570
Cr. st. surf, base	t	1.235	1.225	1.361	1.296	1.220	1.250	1.240	1.220
top	t	1.447	1.465	1.549	1.324	1.460	1.260	1.370	1.750
Asph. conc. cl. b	t	6.333	6.661	6.665	6.757	6.510	6.490	7.195	6.145
Cem. conc. pvmt	sy	3.053	3.295	4.528	3.993	4.050	5.000	4.020	....
Conc. cl A bridge	cy	65.441	60.452	63.706	60.371	61.790	57.210	60.490	69.110
Steel, reinf	lb	0.102	0.098	0.122	0.135	0.125	0.113	0.127	0.120
str	lb	0.204	0.218	0.266	0.284	0.241	0.235	0.270	0.210

Idaho

	Unit	1954	1955	Q2 1956	Q2 1957	Q2 1958	Q2 1959	Q2 1960	Q1 1961
Excavation, unclassified	cy	$0.378	$0.524	$0.440	$0.495	$0.404	$0.364	$0.458	$0.948
Surfacing, asph. (all gr.)	gal	0.141	0.162	0.158	0.189	0.184	0.194	0.165	0.163
plant-mix, bit	t	2.92	3.47	3.36	3.00	2.88		2.82	3.08
crushed rock	t	0.915	1.06	1.07	1.43	1.43	0.983	1.08	1.309
sprinkling	Mgal	0.845	1.18	1.42	1.45	0.935	1.37	1.97	1.369
rolling	hr	4.04	5.24	3.81	5.80	7.19	7.36	7.98	8.70
Concrete, cl A	cy	56.62	62.72	70.70	82.00	57.53	65.57	62.35	65.76
Steel, reinf bar	lb	0.125	0.132	0.138	0.153	0.133	0.142	0.139	0.138
structural	lb	.....	.....	.....	.....	.....	0.184	0.466	0.350

Arizona

	Unit	1954	H1 1955	H1 1956	H1 1957	Q2 1958	Q2 1959	Q2 1960	Q1 1961
Excavation, roadway	cy	$0.63	$0.43	$0.63	$0.91	$0.53	$0.48	$0.65	$0.60
Base, aggregate	t	1.04	0.95	1.10	1.15	1.03	1.14	1.39	1.21
Borrow	t	0.32	0.26	0.37	0.35	0.26	0.36	0.31	0.29
Asphaltic conc	t	2.52	2.32	2.70	2.72	2.33	2.58	2.98	2.69
Liquid asph	t	38.65	37.51	40.75	43.08	44.25	53.51	37.73	32.77
Concrete, str., cl A	cy	45.14	44.98	46.27	47.23	41.84	43.72	47.25	45.61
Steel, reinf bar	lb	0.112	0.109	0.126	0.140	0.133	0.129	0.138	0.117
CMP, culvert 24"	lin ft	5.81	5.58	6.06	6.47	5.84	6.07	7.00	7.42

Nevada

	Unit	1955	1956	1957	1958	1959	1960	Q1 1961
Excavation, roadway	cy	$0.388	$0.506	$0.562	$0.535	$0.397	$0.541	$0.664
Borrow	cy	0.219	0.300	0.291	0.241	0.234	0.249	0.480
Surfacing, plant-mix, bit	t	2.64	2.48	2.96	2.49	2.53	2.41	2.55
Liquid asph	t	31.97	39.86	39.63	35.86	35.18	33.52	34.12
Gravel, tp 1	t	0.660	0.845	0.751	0.683	0.704	0.737	0.776
tp 2	t	0.869	0.893	0.920	0.813	0.925	0.863	0.864
Concrete, str., cl A	cy	61.17	78.98	71.63	71.37	66.86	65.17	67.25
cl AA	cy	61.17	78.98	71.63	71.37	66.86	65.17	67.25
cl B	cy	0.120	0.144	0.147	0.142	0.129	0.127	0.143
CMP, culvert 24"	lf	5.55	6.08	6.72	6.73	6.61	6.67	7.41

California

	Unit	1954	1955	1956	Q2 1957	Q2 1958	Q2 1959	Q2 1960	Q1 1961
Excavation, roadway	cy	$0.45	$0.39	$0.50	$0.63	$0.48	$0.66	$0.71	$0.47
Base, aggregate	t	2.13	2.22	2.17	2.10	1.73	1.77	1.87	2.05
Surfacing, plant-mix, bit	t	4.50	4.93	5.99	*	*	*	*	*
Asph. and bit. mixes	t	*	*	*	6.18	5.67	5.77	*	*
Asph. conc. pvmt	t	*	*	*	*	*	*	5.90	5.92
Steel, reinf. bar	lb	0.094	0.095	0.112	0.119	0.125	0.134	0.099	0.094
str. bridge	lb	0.124	0.142	0.193	0.204	0.158	0.198	0.171	
PCC structural	cy	48.42	45.72	57.06	58.61	54.44	65.39	51.56	53.70
Pavement, PCC	cy	14.41	13.35	14.87	15.59	13.77	14.03	14.11	13.44

* Asphalt concrete pavement was combined with plant-mixed surfacing in the 4th quarter of 1956. Both items were then shown as asphaltic and Bituminous mixes until the 4th quarter of 1959. The designation of Asphalt Concrete Pavement will be used beginning with the 1st quarter of 1960.

MISSISSIPPI TO THE ROCKIES

Hefty increases in 1960 average bid prices for excavation work on Kansas highways feature this section of the country. Other states in the area report mixed bid price trends. In Montana, six work items were up, two down in the 1st quarter. First quarter bids for 10 items in Colorado topped March-June '60. Only two items were lower.

Nebraska reported bids for five work items up, three down in 1960.

But in Wyoming and South Dakota bid prices for most items declined.

Montana

	Unit	1954	1955	1956	1957	1958	1959	1960	Q1 1961
Excav., uncl	cy	$0.211	$0.267	$0.342	$0.273	$0.320	$0.273	$0.257	$0.308
CMP culvert, 24"	lf	6.199	7.057	7.567	6.928	7.174	7.948	7.760	6.886
Top course, gr A 1"	t	1.010	1.139	1.374	1.154	1.210	1.177	1.037	1.050
Base course, 3", cr	t	0.650	0.792	0.929	0.752	0.792	0.756	0.600	0.619
Plant-mix, surf. type II	t	2.588	2.796	3.984	3.223	3.300	3.110	2.870	2.796
Reinf steel	lb	0.138	0.151	0.174	0.148	0.154	0.149	0.149	0.151
Treated timber	Mbf	274.66	298.27	351.11	361.96	329.26	338.85	331.72	340.08
Conc. cl A	cy	58.26	51.72	59.35	51.37	49.23	61.18	56.16	67.45

Wyoming

	Unit	1954	1955	1956	1957	1958	1959	1960
Excav., common	cy	$0.226	$0.243	$0.293	$0.286	$0.257	$0.263	$0.214
Grav. base	cy	0.777	1.152	1.404	1.297	1.159	1.525	1.289
Asph. oil	gal	0.109	0.096	0.120	0.126	0.091	0.110	0.112
Conc. cl. A	cy	51.930	62.446	65.014	60.105	60.287	65.518	62.022
Treated timber	lf	2.731	3.545	3.182	3.717	2.969	2.879	.....
Steel, reinf	lb	.....	.....	.....	.....	0.135	0.139	0.131
str	lb	0.128	0.177	0.251	0.237	0.191	0.182	.....

Colorado

	Unit	1954	1955	1956	1957	1958	1959	Q2 1960	Q1 1961
Excavation, unclass	cy	$0.277	$0.261	$0.337	$0.350	$0.344	$0.325	$0.351	$0.352
Overhaul, station yard	stay	0.008	0.007	0.009	0.009	0.008	0.007	0.007	0.006
yard mile	Ymi	0.099	0.102	0.094	0.104	0.095	0.083	0.099	0.101
ton mile	tmi	0.073	0.071	0.073	0.072	0.066	0.070	0.067	0.066
Subbase	t	0.376	0.343	0.364	0.471	0.524	0.535	0.513	0.546
Surfacing,									
rock or gravel	t	0.746	0.766	0.893	0.991	1.082	0.934	0.997	1.055
plant-mix	t	3.315	3.163	3.130	3.144	3.249	2.964	2.875	2.892
Liquid asph	gal	0.148	0.159	0.176	0.186	0.168	0.178	0.159	0.172
Concrete, structural	cy	48.721	51.251	59.116	56.453	51.601	49.774	52.045	65.636
Steel, structural....	lb	0.142	0.145	0.188	0.205	0.186	0.180	0.187	0.2426
Pavement, cement conc	cy	3.858	3.646	3.502	3.578	3.728	3.835	3.270	3.214
Culvert pipe	lf	7.366	6.955	8.724	8.423	9.251	9.136	8.696	9.358

South Dakota

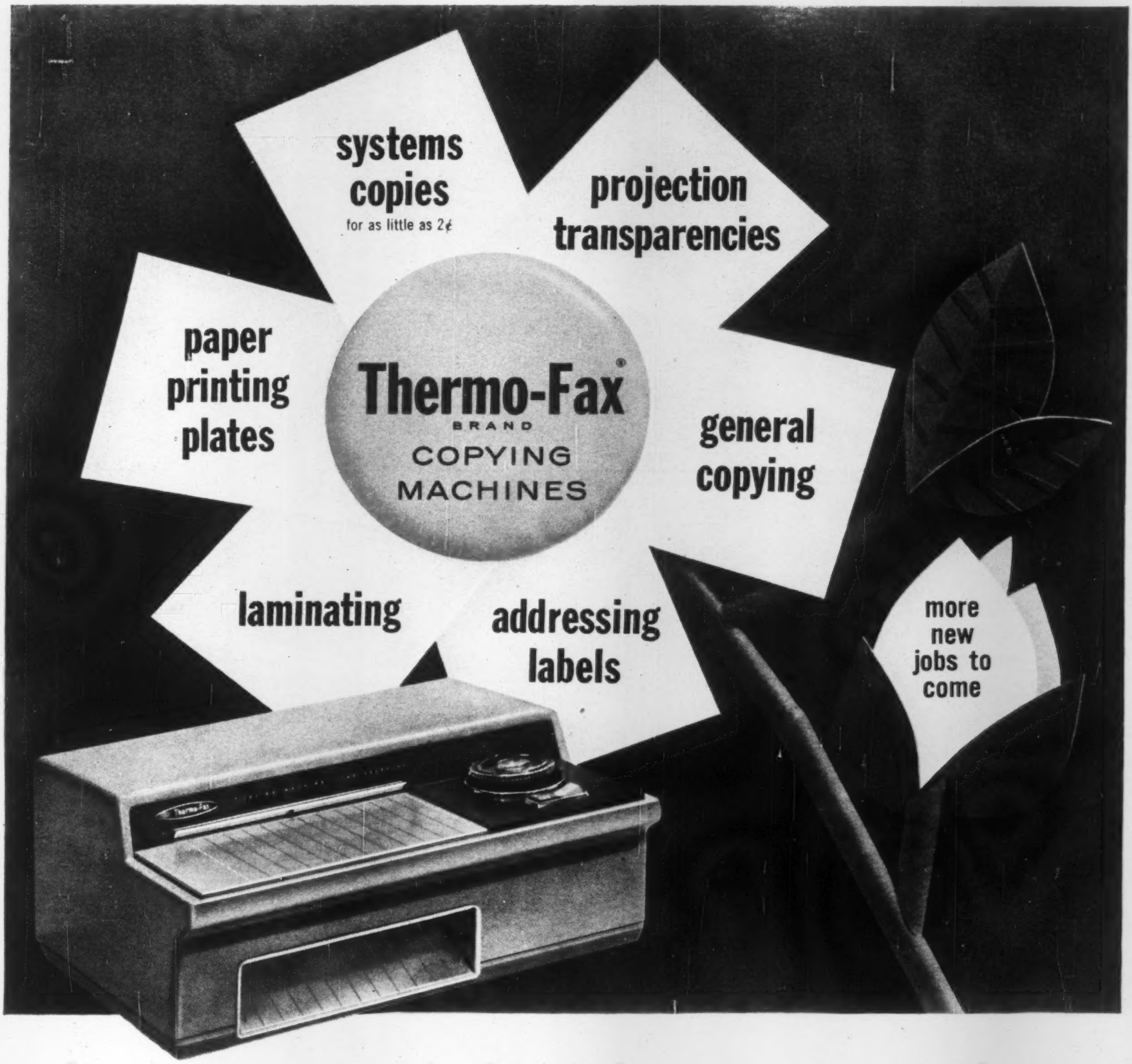
	Unit	1954	1955	1956	1957	1958	1959	1960	Q1 1961
Excavation, roadway	cy	$0.171	$0.179	$0.208	$0.222	$0.226	$0.205	$0.204	NA
Surfacing, plant-mix	t	2.26	2.48	3.27	3.04	3.20	3.26	2.95	NA
crushed gravel	t	0.95	1.01	1.16	1.02	1.90	1.09	1.09	NA
Concrete, cl A	cy	49.23	49.09	52.79	49.99	52.06	50.14	50.34	NA
Steel, reinf bar	lb	0.119	0.122	0.136	0.131	0.124	0.128	0.124	NA
structural	lb	01.46	0.163	0.176	0.182	0.179	0.176	0.186	NA

Nebraska

	Unit	1954	1955	1956	1957	1958	1959	1960
Excavation	cy	$0.173	$0.168	$0.187	$0.191	$0.207	$0.193	$0.200
Culvert conc	cy	41.97	45.95	44.76	43.17	44.71	41.37	42.44
24" Culvert pipe	lf	4.33	4.68	5.05	5.19	5.23	5.28	5.37
Cl. "A" gr. surf	sy	2.10	2.08	2.21	2.31	2.39	2.34	2.45
PCC pvmt	sy	3.54	3.59	3.57	3.44	3.90	3.97	3.80
Asphaltic oil	gal	0.139	0.143	0.155	0.163	0.158	0.159	0.147
Bridge conc	cy	49.01	51.92	58.06	52.34	51.04	49.64	57.49
Str. steel	lb	0.150	0.166	0.231	0.219	0.170	0.164	0.175

Kansas

	Unit	1954	1955	1956	1957	1958	1959	1960
Excav., Rock,	cy	.....	1.300	1.180	.....	1.00	0.300	0.460
Common,	cy	.....	0.189	0.224	0.230	0.260	0.221	0.460
Unclassified	cy	.....	0.257	0.400	0.310	0.237	0.243	0.687
Bridge excav. cil	cy	.....	5.25	4.88	6.11	7.47	4.80	4.75
Steel		.....	.....	.....	.....	.....	.....	.....
Reinf., bridge	lb	.....	0.128	0.132	0.141	0.139	0.139	0.127
Reinf., culverts	lb	.....	0.133	0.138	0.143	0.146	0.148	0.142
Structural, bridge	lb	.....	.....	.....	0.194	0.178	0.165	0.167
Subbase, 4"	sy	.....	0.433	0.487	0.457	0.522	0.451	0.479
Plant mix, surf	t	.....	.....	3.30	3.78	3.94	3.22	3.35
Lt. type surf	cy	.....	2.70	1.93	2.42	2.15	2.44	3.12


systems copies
for as little as 2¢
projection transparencies
paper printing plates
Thermo-Fax®
BRAND
COPYING MACHINES
general copying
laminating
addressing labels
more new jobs to come

does more jobs than any other

... and at amazing savings!

No other one business machine in the world does more jobs than the "Thermo-Fax" Brand Copying Machine . . . plus giving you WHITE copies, both standard and bond-weight. And so economical on every job, too! For example:

Black on white, bond-weight System copies for as little as 2¢ a copy . . . Finished Paper Printing Plates in 30 seconds for as little as 12¢ . . . Ready-to-project Transparencies for as little as 13¢ . . . Many more money-saving jobs!

Get the facts about the versatile "Thermo-Fax" Copying Machine—how it does more paperwork jobs . . . does them faster . . . for less cost than ever before! MAKE US PROVE IT . . . mail the coupon below today. See for yourself why the "Thermo-Fax" Copying Machine is the most versatile business machine!

Thermo-Fax
BRAND
COPYING MACHINES

Thermo-Fax
BRAND
COPYING PRODUCTS

3M COMPANY

MINNESOTA MINING AND
MANUFACTURING COMPANY
. . . WHERE RESEARCH IS THE KEY TO TOMORROW
St. Paul 6, Minn.

THE TERM "THERMO-FAX" IS A REGISTERED TRADEMARK OF 3M COMPANY

Minnesota Mining and Manufacturing Company
Dept. DFH-6221, St. Paul 6, Minnesota

At no obligation, I'm interested in information about how a "Thermo-Fax" Copying Machine speeds, simplifies and cuts costs on the jobs mentioned above.

NAME____________________

COMPANY____________________

ADDRESS____________________

CITY__________ZONE____STATE________

☐ Check if you now own a "Thermo-Fax" Copying Machine.

CIRCLE 85 ON READER SERVICE CARD

BARBER-GREENES PLAY KEY ROLE ON 47 BIG DAM JOBS

Barber-Greene belt conveyor systems were used on 47 big dam jobs for such diverse materials handling applications as moving a mountain at 3,600 tph, aggregate stockpiling and reclaiming, and getting peak production out of aggregate and concrete mixing plants at the site.

Big contracting firms and big contractor combines selected Barber-Greenes for 12 TVA dams and 35 other dam projects scattered through 18 states for many reasons, including the one of prime importance: Barber-Greene belt conveyors move bulk materials at lowest cost per ton.

Get proof by asking your Barber-Greene representative for a belt conveyor system layout and quote on your next job.

Your belt conveyor equipment headquarters

Representatives in Principal Cities of the World

Barber-Greene BG

Main Office and Plant AURORA, ILLINOIS, U. S. A.
Other Plants: DeKalb, Milwaukee, Detroit, Canada, England, Brazil, Australia

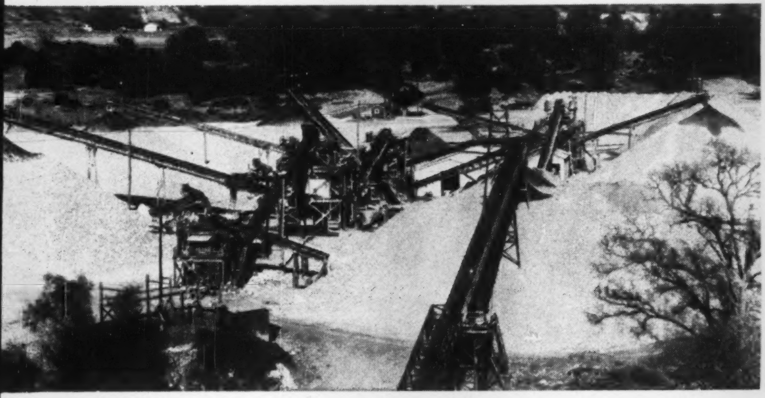
CONVEYORS • LOADERS • DITCHERS
ASPHALT PAVING EQUIPMENT

11 MILLION TONS OF EARTH FILL RIDES DOWN A MOUNTAIN AT TRINITY DAM

Two miles of belt conveyors equipped with over 2,600 Barber-Greene heavy-duty idlers moved 11 million tons of earth fill down a mountain at capacities ranging up to 3,600 tph during construction of Trinity Dam in northern California.

About half of this system ran on a 25% downgrade, and the weight of the material on the belts was harnessed to provide electric power for a portion of this big project.

Although they operated virtually around the clock for three years, the idlers were in excellent condition upon completion of the project and will be sold for re-use on other installations.

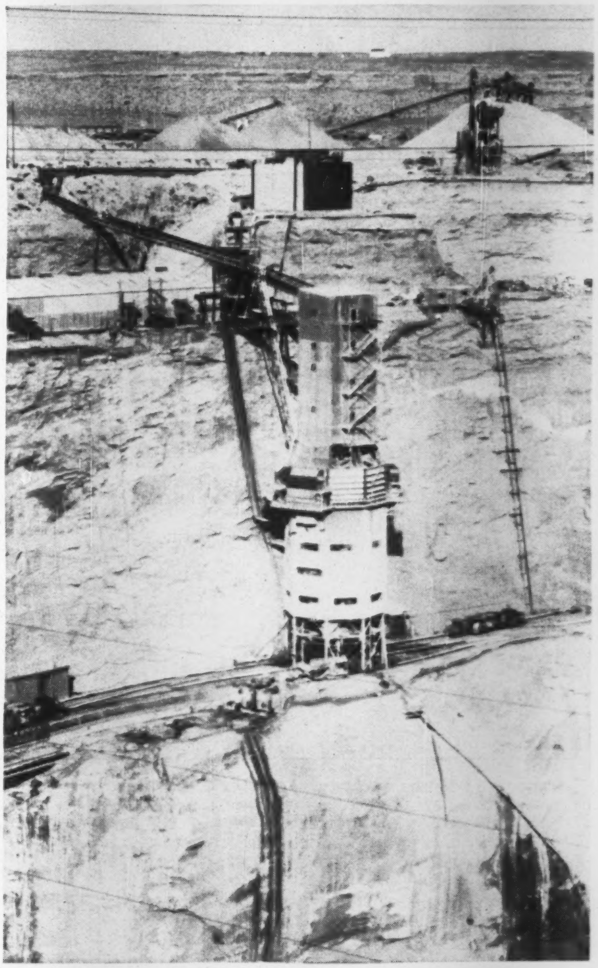


1,100,000 YDS. OF CONCRETE IN MASSIVE FOLSOM DAM

Barber-Greene belt conveyors played a dual role at Folsom Dam: nearly 1,100 ft of conveyors moved materials at the 700 tph aggregate plant shown; and five flights of conveyors were in use at the concrete mixing plant where 1,100,000 cu. yds. of mix was produced for this gigantic structure.

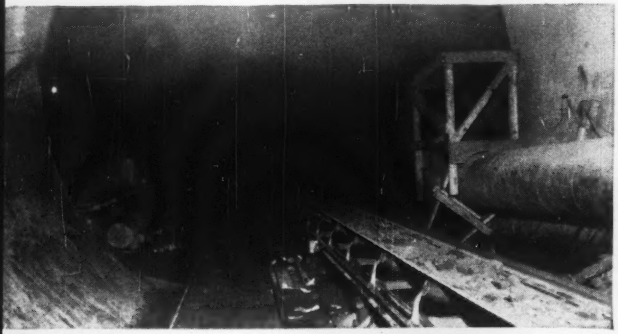
5,659-FT. OF BARBER-GREENES AT WORK ON $107,955,000 GLEN CANYON DAM PROJECT

More than a mile of Barber-Greene belt conveyors are at work on the $107,955,000 Glen Canyon Dam project scheduled for completion in 1965. The contractor uses these conveyors in the 1,400 tph aggregate plant as well as for aggregate stockpiling and moving aggregates to the mixer in the concrete mixing plant. This project, located on the Colorado River on the Arizona-Utah border, is the largest contract ever awarded by the Bureau of Reclamation, and is the biggest competitive contract ever awarded to a single contractor.



EXTENDIBLE BARBER-GREENE CONVEYOR SPEEDS SPILLWAY TUNNELING AT OAHE DAM

As boring machines cut spillway tunnels on the Oahe Dam project, extendible Barber-Greene belt conveyors carried the rock away from the cutters at 640 tph. The conveyor system totalled 2,056 ft on this dam located on the Missouri River near Pierre, S.D.



CIRCLE 87 ON READER SERVICE CARD

MIDDLE WEST

Average bid prices on highway work let in Wisconsin during 1960 showed some sharp gains over the preceding year. Of 8 selected 1960 bid price items, only one, rock excavation, is below '59. Two items, 9" PCC pavement and common grading were unchanged in '60. Up 25%-34% were bid prices for unclassified grading, borrow and plant-mix surfacing.

By contrast, every single one of the 6 items Indiana uses to make up its highway bid price index slipped lower in 1960. Subbase bids were down the most, 24%. Bids on asphalt concrete base were 14% lower than in 1959 and borrow bid prices were down 12%.

Wisconsin

	Unit	1954	1955	1956	1957	1958	1959	1960
Grading, uncl	cy	......	$0.410	$0.420	$0.360	$0.350	$0.337	$0.430
rock	cy	......	0.810	0.960	0.640	0.850	1.58	0.580
common	cy	......	0.560	0.410	0.320	0.290	0.350	0.350
borrow	cy	......	0.510	0.510	0.470	0.430	0.407	0.510
marsh	cy	......	0.280	0.360	0.280	0.260	0.230	0.260
Surfacing, bit. conc	t	......	4.10	4.81	4.07	4.71	4.02	4.26
plant mix	t	......	3.67	4.45	3.84	4.56	3.66	4.91
PCC pvmt, 9"	sy	......	3.42	3.67	3.35	3.32	3.55	3.55

Indiana

	Unit	1954	1955	1956	1957	1958	1959	1960
Excav., common	cy	.....	.....	.....	$0.55	$0.59	$0.55	$0.52
Sp. borrow	cy	.....	.....	.....	0.62	0.68	0.72	0.63
R.C.P. 10"	sy	.....	.....	.....	4.75a	5.39	5.34	5.11
Hot asph. conc. base	t	.....	.....	.....	6.74	7.28	7.23	6.25
surf type B	t	.....	.....	.....	7.13	7.40	7.40	7.01
Subbase, tp I or II	cy	.....	.....	.....	2.30	2.30	2.36	1.79

(a) 9".

MIDDLE ATLANTIC

Highway contractors trimmed their bids for 5 of the 6 work items included in the Empire State's Composite Mile in the 1st quarter of '61 (see p. 92). The deepest slides came in average bid prices for unclassified excavation work, down 20% and concrete paving, down 17% from March-June 1960. First quarter reinforcing and structural steel bids trailed the 2nd quarter of last year by 7%, only bid prices for structural concrete work in Jan-Mar '61 topped March-June '60, and at that, were only up 2%.

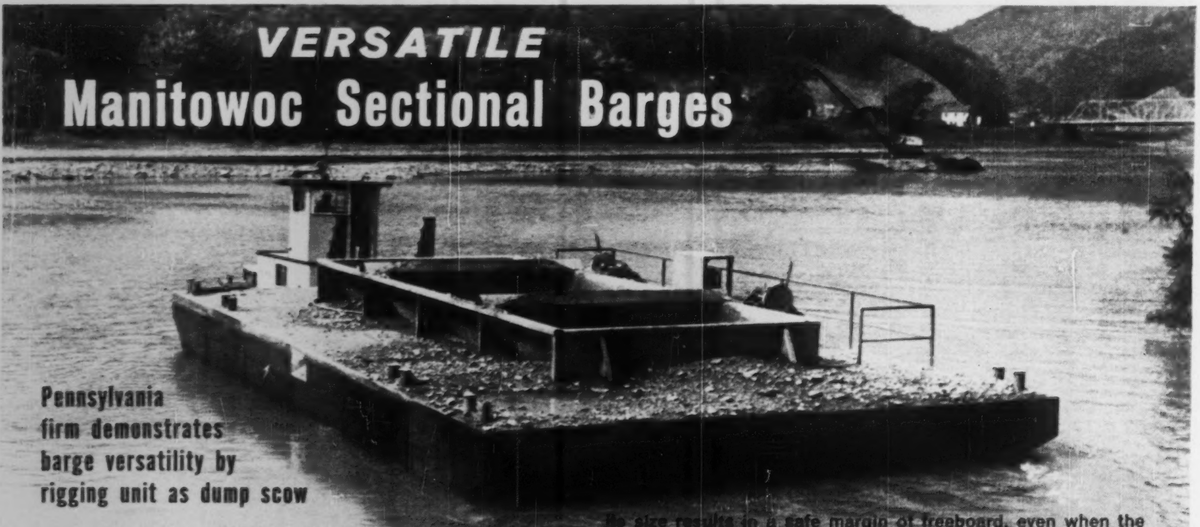
Bid prices on Pennsylvania's highway projects followed mixed trends. The state's semi-annual report shows bids for 4 of 7 selected work items were lower in the final half.

New York

	Unit	1954	1955	1956	Q2 1957	Q2 1958	Q2 1959	Q2 1960	Q1 1961
Excav, Uncl	cy	$0.80	$0.55	$0.83	$0.82	$0.90	$0.55	0.74	$0.59
Portland cem	bbl	4.32	4.43	4.52	4.35	5.36	5.12	4.86	4.62
Struct. conc	cy	49.17	47.95	51.65	68.13	54.88	46.98	49.46	50.25
Steel, reinf	lb	0.13	0.14	0.15	0.13	0.15	0.14	0.15	0.14
struct	lb	0.13	0.16	0.21	0.20	0.15	0.13	0.14	0.13
Cem. conc. pvmt	sy	12.98	13.05	13.46	14.75	13.23	14.24	13.72	11.34

Pennsylvania

	Unit	H 2 1954	H 2 1955	H 2 1956	H 2 1957	H 2 1958	H 2 1959	H 1 1960	H 2 1960
Excavation, Cl I	cy	$1.059	$0.722	$0.705	$0.676	$0.741	$0.573	$0.772	$0.625
Cl II	cy	2.749	4.409	2.960	3.079	3.502	3.026	3.087	3.024
8" cr. agg. base	sy	1.419	.....	2,053	1.793	1.959	1.790	1.977	1.804
Bit, Surf. Id II	sy	1.240	1.016	1.223	1.153	1.031	.....	1,281	1,281
RCC pvmt. 9"	sy	5.175	5.254	5.604	5.901	5.840	5.620	5.913	5.790
Conc. Cl. "A"	cy	52.092	56.127	59.870	60.634	58.740	55.686	53.189	60.596
Conc. Cl. "B"	cy	34.680	44.305	43.177	42.843	43.939	41.936	42.125	42.679
Steel, reinf. bars	lb	0.116	0.118	0.138	0.130	0.124	0.126	0.127	0.126



VERSATILE
Manitowoc Sectional Barges

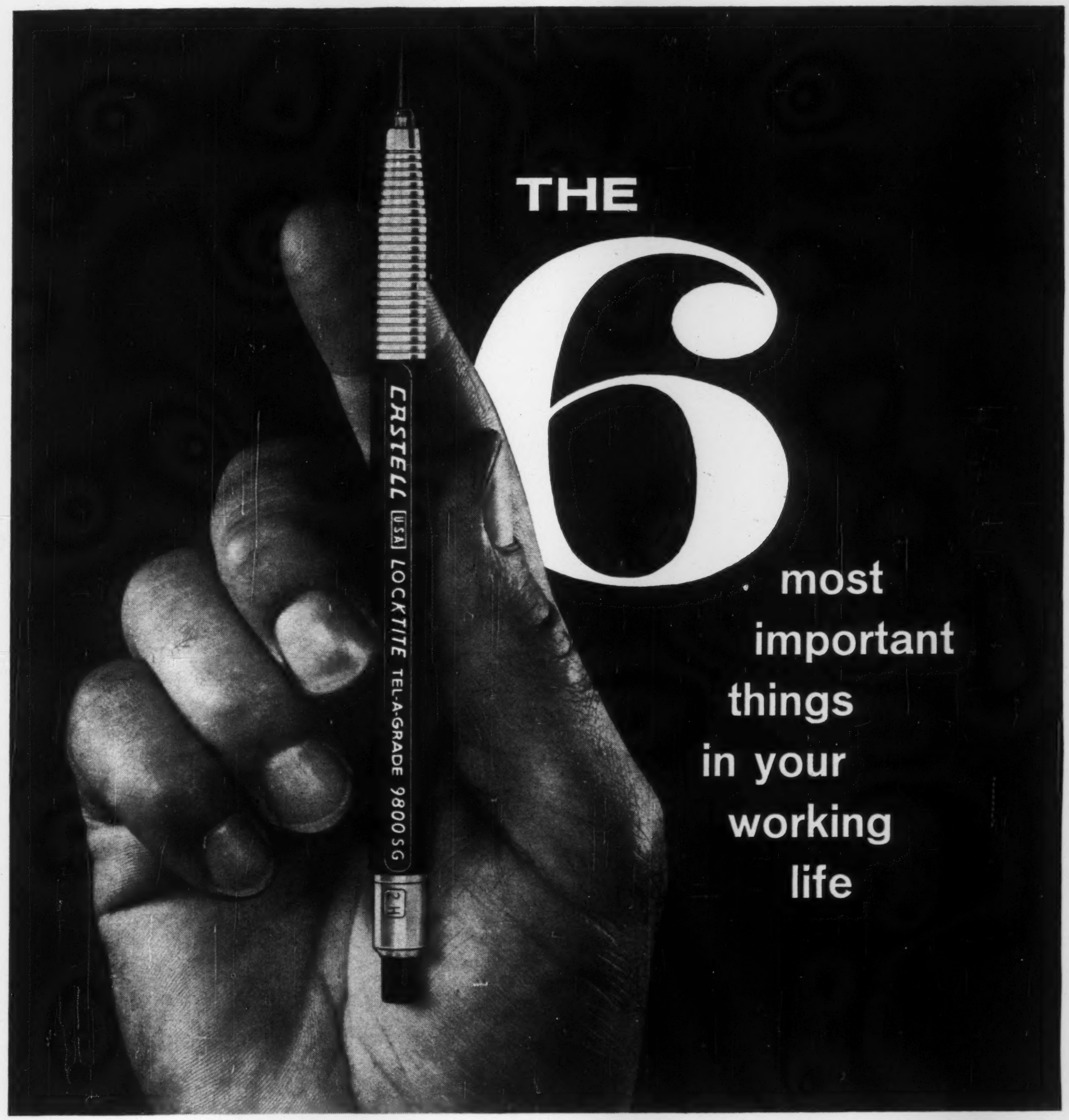
Pennsylvania firm demonstrates barge versatility by rigging unit as dump scow

Tionesta Sand & Gravel Co., Tionesta, Pa., has proven there's no end to the versatility of Manitowoc Sectional Barges. In the job shown here, the company has assembled two standard Type "H" pontoon sections, 40' x 10' x 6', and a pair of raked end sections, 30' x 10' x 6' to form a rectangular, open-centered barge unit, supporting a 100 cu. yd. capacity hopper. The floor of the hopper is formed by two pairs of steel trap doors, which may be opened in combination or individually to dump full or partial loads.

River bottom aggregate on Tionesta's operation is loaded into the bottom dump unit by a dragline working from a Manitowoc Type "L" Sectional Barge. Unmatched buoyancy for a unit of its size results in a safe margin of freeboard, even when the barge carries a full 100 yards of aggregate.

This is just one example of the almost limitless number of applications for which Manitowoc Sectional Barges are used. Any type or shape is possible through various combinations of individual pontoons. A variety of optional equipment is available. And you're not limited to use in only one area . . . simplified assembly and disassembly means individual sections can be transported by rail or truck. Get more information now from your Manitowoc Crane distributor, or write direct.

MANITOWOC ENGINEERING CORP.
(A subsidiary of The Manitowoc Company, Inc.)
MANITOWOC, WISCONSIN



The 6 most important things in your working life are your five skilled fingers and your A.W.FABER #9800 SG LOCKTITE Tel-A-Grade Lead Holder.

LOCKTITE becomes a part of your creative process. The no-slip functional grip gives you smooth traction and practically banishes finger fatigue. Gun-rifled clutch holds the lead like the jaws of a bull dog. Unique indicator reveals the degree in use at a glance. Carries ironclad 2-year guarantee. A.W.FABER will replace the entire holder at no charge if any part wears out in normal usage. Yes, you can buy cheaper lead holders, but can you afford to let pennies stand between you and your perfect working tools? Buy quality —buy LOCKTITE, call your dealer today.

Castell Drawing Leads #9030, *are of the identical quality and grading as world-famous Castell wood pencil* ■ *Usable in all standard holders, but a perfect mate for Locktite* ■ *Draws perfectly on all surfaces, including Cronar and Mylar base films* ■ *Available in all degrees from 7B to 10H, and in a kaleidoscope of colors* ■

FABER-CASTELL

A.W.FABER-CASTELL
Pencil Co., Inc., Newark 3, N. J.

Our Bicentennial year—1761-1961
200 years of uninterrupted
manufacturing experience.

A.W.FABER CASTELL DRAWING LEAD 9030

. . . Highway Bid Prices—continued

THE SOUTH

Highway bid prices slumped in Kentucky and Mississippi during 1960. Every single one of 11 selected unit prices in Kentucky and 14 out of 15 items in Mississippi averaged lower than in 1959.

A 19% slide in bid prices for cement concrete surfacing, was the feature of 1960 bidding trends in Kentucky.

Bid prices for highway work in Virginia were mixed in the 1st quarter of '61. Excavation bids were 12% lower than their 1960 average. And bid prices for rebar work were down 2%. But surfacing bid prices were 4% higher. And structural concrete bids were up 1%.

U.S. COMPOSITE

Three of the five bid price items included in the U.S. Bureau of Public Roads' Composite mile, concrete pavement, structural steel and rebar work, dipped below their 1960 averages during the 1st quarter of '61. One item, common excavation was unchanged from last years' average.

Bid prices for structural concrete work in the 1st quarter alone topped the 1960 average, and that by only 0.9%.

U.S. Bureau of Public Roads

	Unit	1954	1955	1956	1957	1958	1959	1960	Q1 1961
Common, excav	cy	$0.35	$0.36	$0.38	$0.40	$0.39	$0.38	$0.38	$0.38
Concrete pvmt	sy	3.63	3.67	3.89	4.02	4.02	3.99	3.88	3.79
Steel, reinf	lb	0.116	0.116	0.131	0.137	0.130	0.127	0.122	0.121
struct	lb	0.167	0.165	0.202	0.218	0.193	0.184	0.174	0.170
Struct, conc	cy	50.91	51.99	54.33	56.92	54.92	53.42	52.15	52.63

Average bid prices on Federal-aid highway construction contracts let by state highway departments.

Costs Roundup—2nd Quarter

Virginia

	Unit	1954	1955	1956	1957	1958	1959	1960	Q1 1961
Excavation	cy	$0.48	$0.60	$0.79	$0.70	$0.54	$0.46	$0.49	$0.43
Surfacing	sy	2.00	2.14	2.16	2.42	2.11	2.53	2.07	2.15
Concrete, structural	cy	60.39	58.56	70.59	73.63	66.24	57.93	59.14	59.70
Steel, reinf bar	lb	0.1229	0.1229	0.1500	0.1513	0.1377	0.1239	0.1207	0.1182

Kentucky

Grading	Unit	1954	1955	1956	1957	1958	1959	1960
Road Excav	cy	$0.500	....	$0.510	$0.460	$0.660	$0.570	$0.556
Cl. "A" conc	cy	50.42	....	55.22	55.69	61.82	57.47	53.73
R. C. pipe culv. 24"	lf	5.28	....	5.55	6.25	6.58	6.68	6.45
Surfacing—								
Rock or gravel	t	2.90	....	3.36	3.59	3.40	3.71	3.12
Oils	gal	0.130	....	0.148	0.155	0.164	0.160	0.155
Ready-mix	t	6.23	....	6.90	7.03	7.27	7.36	6.47
PCC	sy	4.06	....	4.65	4.92	5.60	6.27	5.06
Structures—								
Excavation	cy	4.93	....	4.17	5.88	6.13	6.35	5.34
Cl. "A" conc	cy	50.42	....	55.22	55.69	61.82	57.47	53.73
Struct. steel	lb	0.230	....	0.230	0.312	0.232	0.250	0.190
Reinf. steel	lb	0.120	....	0.133	0.138	0.136	0.130	0.128

Mississippi

	Unit	1954	1955	1956	1957	1958	1959	1960
Excavation*	cy	$0.307	$0.276	$0.271	$0.316	$0.304	$0.300	$0.295
Topping*	cy	0.84	0.76	0.78	0.90	0.81	0.96	0.92
R.C.C. pavement,								
7"-5"-7"	sy	2.79	2.13	2.54	2.45	2.42	2.78	2.23
8"-6"-8"	sy	3.61	2.50	2.99	2.88	2.85	3.28	2.62
9"-6"-9"	sy	3.18	2.42	2.89	2.79	2.76	3.17	2.54
Asphalt	gal	0.162	0.157	0.156	0.159	0.165	0.168	0.154
Cover mat'ls	cy	6.59	6.43	6.43	6.88	7.43	7.32	6.49
Gr. sr. course	cy	2.66	2.90	2.68	3.11	2.92	2.79	3.21
Stabilizer, agg	cy	4.40	3.19	3.17	3.36	3.72	3.57	2.56
Conc. cl. B, C. bri	cy	49.23	47.25	53.61	63.08	60.89	55.04	49.78
Steel, reinf	lb	0.120	0.115	0.123	0.134	0.136	0.134	0.121
struct	lb	0.130	0.120	0.170	0.191	0.180	0.153	0.139
Treated timbr	Mbf	290.24	255.75	278.28	313.97	288.78	350	250.68
Piling,								
Timbr, creo	lf	1.95	2.02	2.03	2.20	2.31	2.04	1.86
steel	lf	3.91	3.66	4.29	4.33	5.16	5.02	4.78

* incl. haul

PARK
PARK
EXIT
ENTER

Photo of stressing end of a single tee to be used in large parking garage with spans of 63' and spaced 28' apart.

THE PRESCON SYSTEM OF POST-TENSIONING FOR PARKING GARAGES PROVIDES DESIGN FLEXIBILITY AND ECONOMY

Houston's parking problem will be reduced by the Allright, Inc. parking garage* (250 car capacity and 3000 sq. ft. of retail space). Using poured-in-place, pan type construction; joists are 18½" deep, maximum spans of 50'6", maximum bay width 43'6". Slabs covering the roof and retail areas are post-tensioned to render them waterproof.

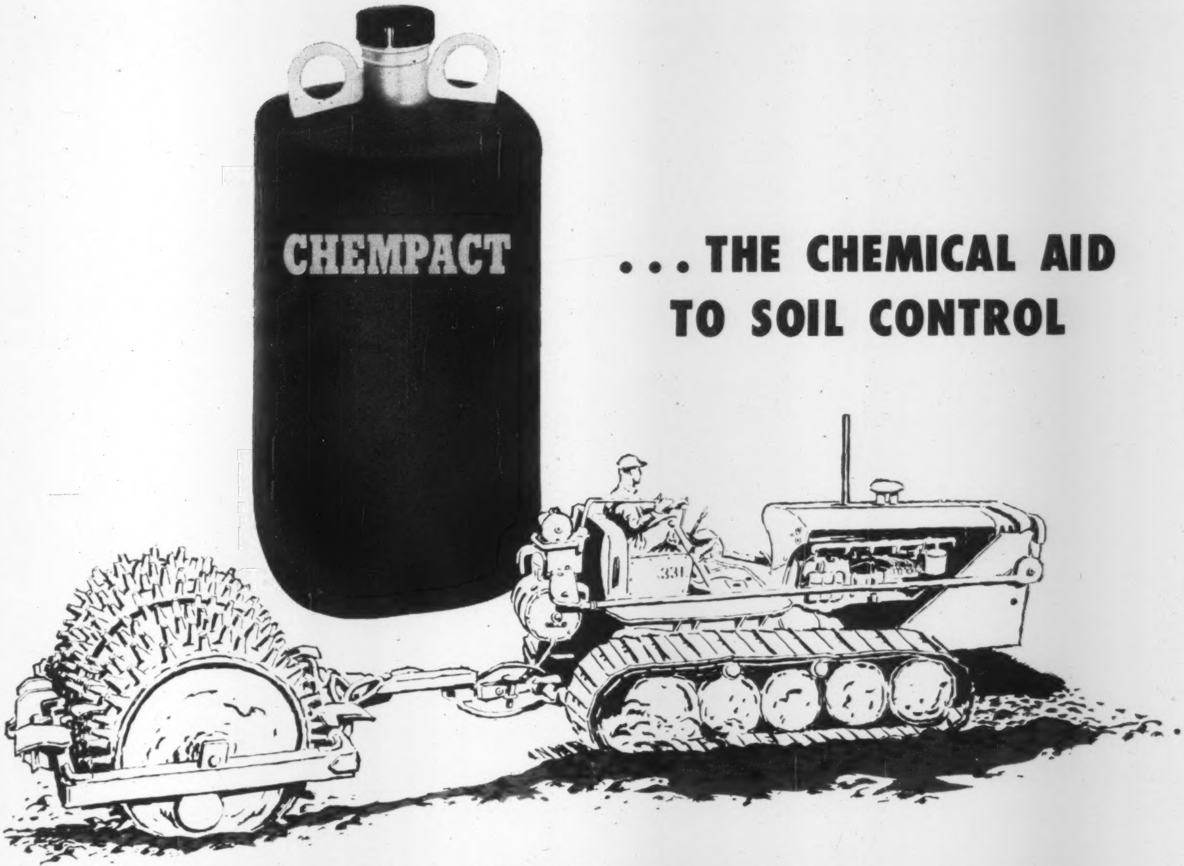
Parking garages, nation-wide, have used these other types of construction with the Prescon System of post-tensioning: (1) Lin tees with stressed poured-in-place slabs, (2) dia-grid poured in place, (3) precast prestressed elements, (4) lift slabs.

For job site or yard use with many structure types, the Prescon System of post-tensioning offers savings and design flexibility using readily available materials.

Other parking garages using Prescon System: Dalton, Dallas; 1st Nat'l Motor Bank, Longview, Texas; Major Oil Company, downtown, Houston; Beverly Hills, (Calif.); Am. Nat'l Bank, Denver; Bd. of Trade, Kansas City; Hollywood Legion Bowling, (Calif.); Remington-Rand and Baldwin Chevrolet, Los Angeles.

*Consulting Engineers: Mullen and Powell, Dallas
Contractor: Spaw-Glass, Inc., Houston

THE PRESCON CORPORATION
© The Prescon Corp
General Offices: P. O. Box 4186, TUlip 2-6571, Corpus Christi, Texas
Branch Offices: Albany, N. Y., Atlanta, Ga., Dallas, Texas, Denver, Colo., Los Angeles, Calif.
Member Prestressed Concrete Institute



. . . THE CHEMICAL AID TO SOIL CONTROL

REDUCES COMPACTION TIME

New money making Partner to regular compaction methods

Good compaction practices plus use of Chempact will reduce compaction costs where difficult soil conditions exist; Chempact also makes many soils normally wasted . . . usable in grades and fills.

WRITE NOW FOR FREE DESCRIPTIVE BROCHURE . . . and further information

ANOTHER REYNOLDS *FORMULA*

EASY TO APPLY:
Merely add 1 gallon Chempact per 1,000 gallons of water as tank is being filled . . . Chempact requires no agitation.

ECONOMICAL TO USE:
1,000 gallons of water and 1 gallon of Chempact covers 5 to 10,000 sq. feet of surface area, depending on soil conditions.

LOW PRICE:
Chempact saves its cost a multitude of times . . . reducing on the job time for heavy equipment.

CHEMPACT

THE CENTRAL-REYNOLDS COMPANY

P. O. BOX 1203 FRESNO, CALIFORNIA PHONE ADams 7-1249

Highway Bid Price 'Sub' Indexes

As part of their composite highway bid price indexes (pgs 82-83), several states and the U.S. Bureau of Public Roads compile indexes for components of highway work, such as excavation, surfacing, etc. These "sub" indexes can be very valuable in spotting bidding trends that may cancel each other out in the weighted composite indexes.

Below are highway bid price "sub" indexes reported by seven state highway departments and by the U. S. Bureau of Public Roads as part of its Composite Mile Index.

The chart shows "sub" indexes constructed by ENR for the six bid price items included in N. Y. State's Composite Mile.

"Sub" indexes are helpful in tracking widely fluctuating bid prices, such as excavation bids on N. Y. highways.

The U. S. Composite Mile

U. S. Bureau of Public Roads—1925-'29 = 100

	1954	1955	1956	1957	1958	1959	1960	Q1 1961
Common, excav	100.9	101.9	108.2	113.5	112.5	109.1	108.1	108.3
Concrete, pvmt	163.6	165.3	175.5	181.2	181.1	179.9	174.9	170.9
Structures	229.9	232.8	253.8	267.0	253.3	246.5	238.3	238.1

Weightings used in BPR Composite Mile Index are: excavation 17,491 cy (other than common excavation expressed as equivalent of common); surfacing, 3,726 sy (other than Portland cement concrete expressed as equivalent of Portland cement concrete); reinforcing steel, 16,000 lb; structural steel, 4,325 lb; structural concrete, 68 cy

Montana—1950 = 100

	1954	1955	1956	1957	1958	1959	1960	Q1 1961
Grading & Drainage	68.68	84.46	102.60	84.58	95.82	88.32	84.54	90.91
Surface & Base	71.20	81.88	98.05	82.42	83.59	80.02	70.38	67.84
Structures	94.82	91.97	106.05	93.96	91.61	102.68	97.67	106.60
Miscellaneous	95.98	105.25	133.79	114.77	112.01	110.90	92.94	88.36

To arrive at the composite index shown in the table on page ...., the Montana Highway Department weights the above classifications as follows: (figures in parentheses are the weights used prior to the first quarter of 1961).) Grading & Drainage 34% (39%;) Surface & Base 46% (40%); Structures 15% (9%) Miscellaneous Items, 5% (12%)

Oregon—1940 = 100

	1954	1955	1956	1957	1958	1959	1960	Q1 1961
Grading, uncl	157.2	156.0	201.3	212.5	163.4	180.0	184.9	192.2
Surfacing,								
bit. macadam	172.1	130.5	192.9	186.0	187.8	181.3	180.6	187.6
cr. rock	148.1	136.3	177.5	155.8	159.0	145.4	137.3	130.1
Conc. bridge & st.	266.6	275.5	307.1	301.7	292.3	284.6	296.0	288.0
Asph. conc. pvmt	114.0	114.3	132.7	121.5	113.4	110.8	114.3	118.5
PCC pvmt	234.2	241.8	255.5	253.5	275.9	262.8	258.9	253.8

Illinois—1937-'41 = 100

	1954	1955	1956	1957	1958	1959	1960
Grading (14%)	182	148	163	207	159	180	192
Surfacing (58%)	150	143	145	155	154	160	160
Structures (28%)	267	268	313	353	300	285	285

Kansas—1940 = 100

	1954	1955	1956	1957	1958	1959	1960
Grading & culverts	175	199	188	196	209	233	210
Concrete pavement	235	242	249	241	255	254	252
Aggr. base course	130	169	159	167	165	158	151
Bit. const. types	202	205	198	169	174	175	176
Lt. type surf	144	153	122	144	143	169	184
Bridges (conc.)	336	348	338	372	372	360	330
Bridges (steel)	298	320	336	368	363	318	325

Virginia—1937-'41 = 100

	1954	1955	1956	1957	1958	1959	1960	Q1 1961
Excavation	170.2	212.8	280.1	248.2	191.5	163.0	173.8	152.5
Surfacing	197.6	211.5	213.4	239.1	208.5	250.0	204.5	212.5
Structures	267.7	261.2	315.7	327.1	294.9	259.4	262.3	263.3

Pennsylvania—1940 = 100

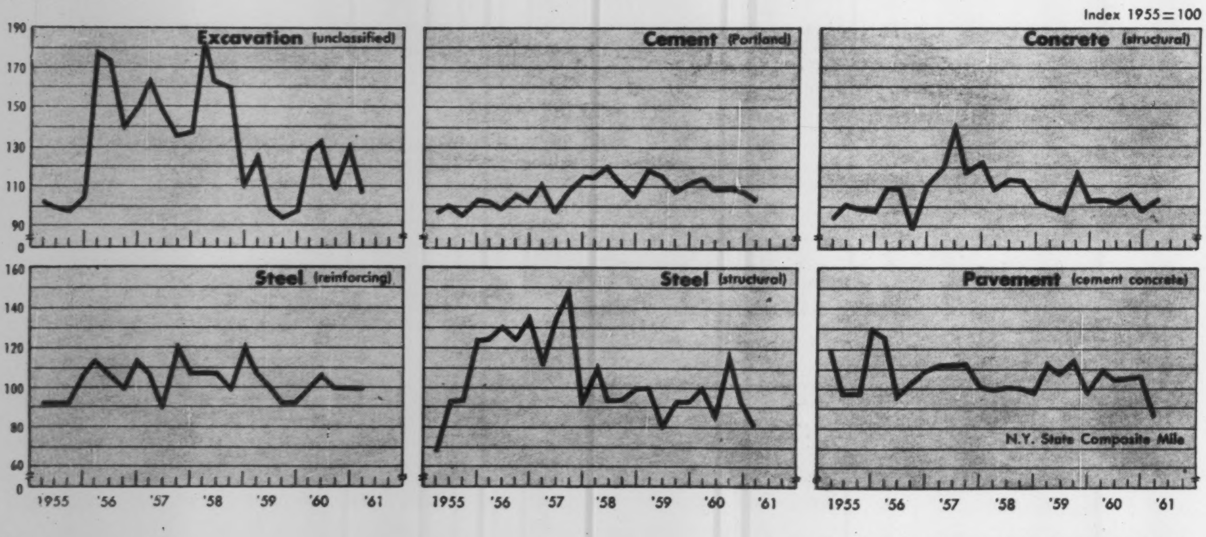
	H 2 1954	H 2 1955	H 2 1956	H 2 1957	H 2 1958	H 2 1959	H 1 1960	H 2 1960
Excavation, Cl I	253.96	173.14	169.06	162.06	177.70	137.41	171.94	149.88
Cl II	163.63	262.44	176.19	183.27	208.45	180.12	173.52	180.00
Cr. agg. base, 8"	175.62	......	254.08	221.91	242.33	221.53	247.43	223.27
Bit. surf.*	178.42	146.19	175.97	165.90	148.34	......	169.00	169.89
RCC pvmt., 9"	205.77	208.91	222.82	234.63	232.21	223.46	228.65	230.22
Conc., Cl A	231.29	249.29	265.83	269.22	260.81	247.25	240.12	269.05
Cl B	197.03	251.72	245.31	243.41	249.64	238.26	239.33	242.48
Steel, reinf. bars	257.78	262.22	306.67	288.89	275.56	280.00	288.64	280.00

* DP-1, 1954-'59 — ID II, 1960

Connecticut—1939 = 100

	June 1956	June 1957	June 1958	Dec. 1958	June 1959	Dec. 1959	June 1960	Dec 1960
Structures	289.62	327.46	239.80	235.06	242.15	253.29	249.20	253.84
Grading	294.43	319.46	267.73	254.02	261.13	267.04	267.27	269.91
Trunk line	239.53	245.88	218.04	213.79	225.92	227.09	227.65	230.16
Concrete pvmt.	267.90	272.87	249.19	245.36	241.46	246.27	244.97	241.04
Town aid	265.94	263.64	243.02	229.65	228.30	230.52	233.89	236.62

New York



Hold the
winning hand
on your
next project!
A
A
A
A
Win
with
a
GRAVER
PARTNERSHIP
(Joint Ventures)

**YOU'RE HOLDING FOUR ACES
WHEN YOU WORK WITH GRAVER.**

Fabricating and erecting environmental chambers, refrigerated storage, missile components, pressure vessels, towers, reactors, penstocks . . . any steel or alloy plate work . . . is the business of Graver. Established 1857.

Now Graver offers additional services and ideas that can save you thousands of dollars in engineering and construction costs.

Graver Tank & Mfg. Co.
35 EAST WACKER DRIVE, CHICAGO 1, ILLINOIS

Graver | ONE OF THE UNION U TANK CAR COMPANIES

CIRCLE 93 ON READER SERVICE CARD

Get the facts now on these unique Services—

- ♠ **GRAVER PARTNERSHIP—Joint Ventures**
- ♥ **GRAVER CONSTRUCTION METHODS —Specialized Construction Counsel**
- ♦ **GRAVER ENGINEERING—Research & Development**
- ♣ **GRAVER FINANCING PLANS—Bonding Assistance**

BE THE LOWEST BIDDER WITH THE HIGHEST PROFITS. Get the winning details now.

GRAVER TANK & MFG. CO., 35 EAST WACKER DRIVE, CHICAGO 1, ILL.

☐ **Let's talk** ☐ **Write me about it**

Name Title

Company

Address

City and State

CIRCLE 94 ON READER SERVICE CARD→

Clean burning Gulf® fuels help contractor ahead of schedule...

Contractor M. C. Winters, Johnson City, Texas, has jobs all over the state of Texas. There's a dam at Jasper, a cloverleaf at Beaumont, freeway work in Houston and an excavation and grading contract on the Galveston seawall.

That last job includes the loading, hauling, dumping, spreading and compacting of sand. It's backfill for the new 6900′ extension of the seawall. Although hampered by bad weather, Winters moved 640,000 cubic yards of fill in a 9-week period this past winter. Peak days saw 30,000 yards moved. "Those bottom dumps ran steady for 16 hours a day when the weather was good," reported B. L. Brown, Project Superintendent. "Working so close to the Gulf of Mexico, I thought we might have some problems with fuel system parts rusting. We didn't, as a matter of fact we've had no downtime that can be traced to fuel trouble."

On this project, and others, Winters used clean burning diesel fuel and Good Gulf gasoline to improve engine performance and prolong useful engine life with reduced maintenance. Both of these fuels are exceptionally stable and will not form harmful gum deposits.

To get the most out of your equipment, try clean burning Gulf fuels on your next project. You'll soon

finish seawall job

GULF MAKES THINGS RUN BETTER!

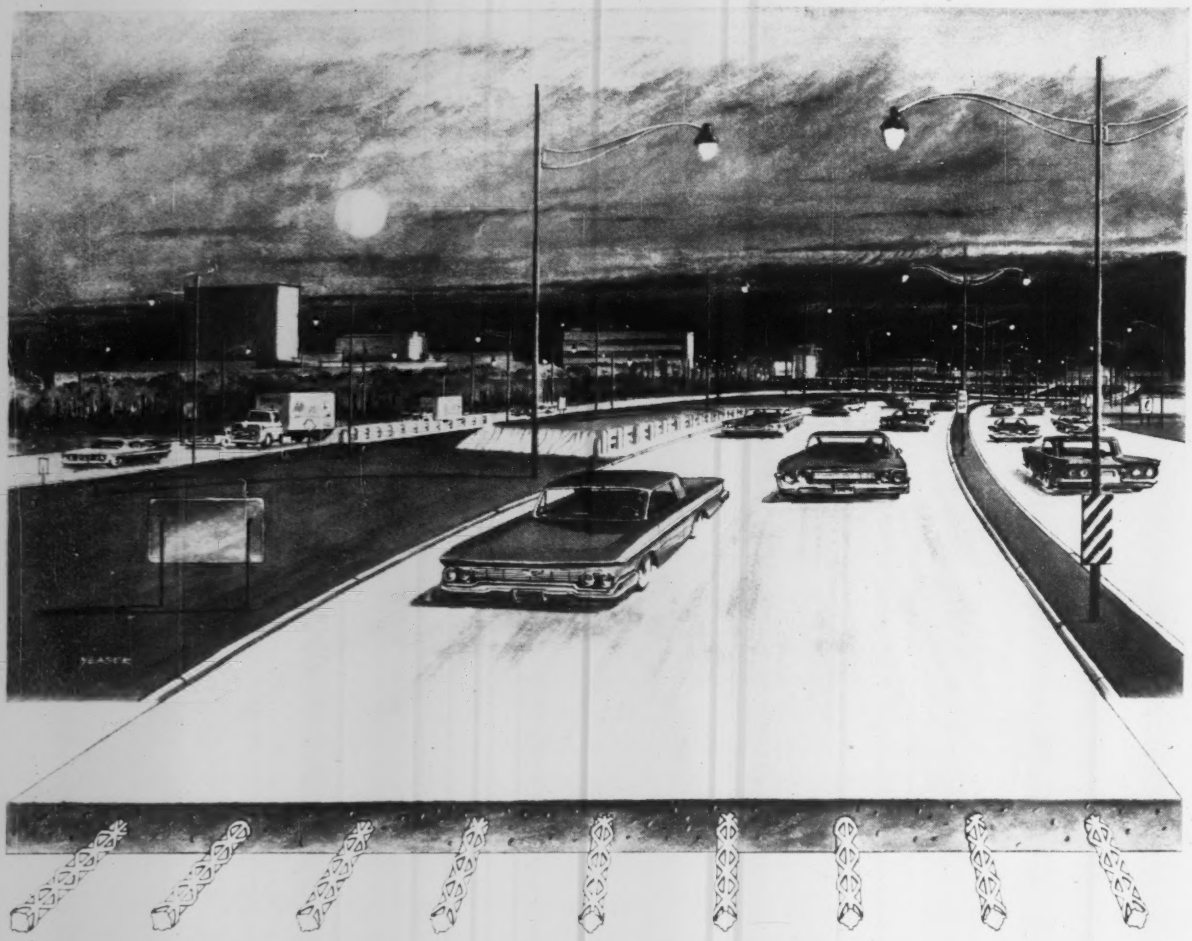
see how Gulf makes things run better! Contact your nearest Gulf office for a quotation. For helpful maintenance tips, and information on Gulf products, write 88-page "Contractor's Guide."

GULF

GULF OIL CORPORATION
Dept. DM, Gulf Building
Houston 2, Texas

A. P. Miles, left, local Gulf distributor; B. L. Brown, center, Project Superintendent; and Jeff Bolling, Gulf Sales Engineer, gather for a job-site conference. Expert on-the-job engineering counsel is an important part of Gulf's service to contractors. ▶

SP 10086



Connors Reinforcing Bars serve the roadbuilding industry

. . . with built-in strength for highway bridges and pavement.

A new concept of concrete pavement design has passed the testing stage—**continuously reinforced concrete** pavement. Hidden beneath ribbons of concrete are deformed Reinforcing Bars to provide strength and durability at less over-all cost. **Continuously reinforced pavement** means more value for your dollar by providing long life with minimum maintenance.

Connors produces and fabricates **High Strength** Reinforcing Bars meeting the exacting specifications of modern day construction.

Connors Reinforcing Bars arrive at your job site, neatly bundled and tagged for immediate application. Rely on Connors for your reinforcing steel needs.

CONNORS WORKS
P. O. Box 2562 • Birmingham, Ala. • WOrth 1-3711
WEST VIRGINIA WORKS
P. O. Box 118 • Huntington, W. Va. • JAckson 9-7171

Steel

CONNORS STEEL DIVISION **PORTER** ***H.K. PORTER COMPANY, INC.***

PORTER SERVES INDUSTRY with steel, rubber and friction products, asbestos textiles, high voltage electrical equipment, electrical wire and cable, wiring systems, motors, fans, blowers, specialty alloys, paints, refractories, tools, forgings and pipe fittings, roll formings and stampings, wire rope and strand.

CIRCLE 96 ON READER SERVICE CARD

Costs Roundup—2nd Quarter

Costs Up—Contractors' Prices Mixed

Building contractors' prices are following mixed trends while basic costs climb to record peaks.

The George A. Fuller Co.'s Eastern states general building price index and the Fruin-Colnon Contracting Co.'s industrial building price index for St. Louis rose about ½ of 1% in the first four months. Turner Construction Co.'s Eastern States general building price index and The Austin Co.'s Central & Eastern states industrial building price index are holding steady.

But the Smith, Hinchman & Grylls general building price index for Detroit slipped 1.1% between January and April to its lowest value since December 1958.

In 18 of the 20 major U. S. cities covered by the ENR Cost Indexes, construction costs advanced in the 2nd quarter. Heftiest increases came in San Francisco, up 5.1%, Los Angeles, up 5.0% and Chicago, 4.7% higher than March '61. Construction costs in Cleveland, Denver and Kansas City have tacked on 3% since March. ENR Construction Cost Indexes for Boston rose 1.6% and Minneapolis' index moved up 1.8% in the past three months.

In each of these cities, increases in common labor wage rates touched off the cost rise. These wage hikes were: 18 cents an hour in Los Angeles and San Francisco; 20 cents in Chicago, 15 cents in Cleveland; 10 to 15 cents an hour in Denver and 12½ cents in Kansas City.

Compared with this time last year, Los Angeles shows the greatest increase in construction costs, 8.2%. ENR Construction Cost Indexes are up 5.0% in New York and 4.0% in Atlanta, Birmingham, and San Francisco. Other cities where construction costs rose at least 3% in the past 12 months are Boston, Chicago, Cleveland, Denver, Kansas City and Seattle. Only one city showed a decline in construction costs since last June. Cincinnati's ENR index dipped 0.04%.

Building costs in every single one of ENR's 20 cities swung higher in the 2nd quarter. Up 2.0% to 2.3% were costs in Boston, Chicago, Cleveland, Los Angeles, Minneapolis and San Francisco. ENR Building Cost Indexes for Atlanta, Birmingham, Cincinnati, Detroit, Kansas City, New Orleans, Philadelphia and Seattle rose between 1.0 and 1.7% during the second quarter.

Building costs in Boston, showed the greatest 12-month increase of any of the 20-cities, 5.0%. New Orleans' ENR Building Cost Index dipped 0.7% since last June. Building cost increases in the other 18 cities ranged from 0.3% in St. Louis to 3.4% in New York.

Wage boosts for skilled construction trades which put steam into the rise in building costs included: 21 cents an hour for bricklayers in New York; 20 cents an hour for carpenters in Boston and structural ironworkers in Chicago; 18 cents for Minneapolis carpenters; 17½ cents for bricklayers in Chicago; 17 cents for Chicago carpenters and 16 cents for structural ironworkers in Seattle.

Higher prices for Douglas fir lumber in 9 cities and for Southern pine in 5 cities helped lift costs in the 2nd quarter. And these prices will probably play an important role in pushing costs higher in the months just ahead.

Construction and Building Cost Indexes

NAME, AREA & TYPE	Bases=100 orig	Bases=100 Used Here	1949	1957	1958	1959	1960	1961 Jan.	1961 Feb.	1961 Mar.	1961 Apr.	1961 May	1961 June
General Purpose Cost Indexes													
ENR Construction Cost, 20-cities aver†	1913	Same	477	724	759	797	824	834	834	834	838	847	850
ENR Building Cost, 20-cities aver†	1913	Same	352	509	525	548	559	563	563	563	565	569	570
Assoc. General Contractors, 12-cities aver†	1913	Same	342	483	499	517	534	539	538	538	538	...	...
U. S. Dept of Commerce, composite	1947-49	1915	363	482	486	496	504	507	507	507	507	...	...
Contractor Price Indexes—Building													
Aberthaw, New England, Industrial	1913	Same	312	453	453	473	486	...	...	...	...	...	...
Austin, Central & Eastern, Industrial	1926	1913	307	420	427	429	431	...	...	431	...	...	...
Fruin-Colnon, St. Louis, Industrial	1926	1913	382	512	530	551	571	577	577	580	580	...	...
Fuller, Eastern Cities, General	1913	Same	382	504	526	545	559	568	...	...	570	...	...
Turner, Eastern Cities, General	1939	1913	413	576	576	587	589	589	...	...	589	...	...
Smith, Hinchman & Grylls, Detroit, General	1926	1913	395	568	565	575	583	570	569	568	564	...	...
Valuation Indexes													
American Appraisal, 30-cities, Industrial*	1913	Same	490	663	682	704	722	732	733	733	...	...	...
E. H. Boeckh, 20-areas; Comm'l & Factory	1926-29	1913	369	507	517	535	544	543	543	543	544	...	...
Marshall & Stevens, nat'l aver., Industrial	1926	1913	365	515	528	544	554	...	...	...	554	...	...

* Adjusted for productivity
† No adjustment for productivity

ENR Cost Indexes for 22 Cities—1913=100

Construction Cost Index

City	June '49	June '58	June '59	1960 Mar	1960 Jun	1960 Sep	1960 Dec	1961 Mar	1961 Jun
Atlanta	345	558	594	639	633	650	653	652	658
Baltimore	425	701	711	740	755	755	753	754	756
Birmingham	389	593	624	653	654	674	674	674	680
Boston	526	793	832	833	836	833	849	853	867
Chicago	526	838	875	919	919	917	911	905	948
Cincinnati	487	746	790	815	845	844	839	837	845
Cleveland	514	850	919	920	944	943	944	946	976
Dallas	398	553	573	604	629	639	640	640	640
Denver	482	725	742	758	752	756	756	756	779
Detroit	489	852	945	946	966	964	964	963	984
Kansas City	501	762	793	798	823	818	813	812	838
Los Angeles	478	814	839	870	870	908	901	897	942
Minneapolis	504	818	855	860	890	890	885	897	913
New Orleans	379	591	620	644	649	640	649	654	661
New York	534	912	978	1011	1008	1038	1036	1057	1059
Philadelphia	492	795	804	793	830	830	830	830	848
Pittsburgh	492	819	840	870	885	885	885	885	885
St. Louis	508	840	891	880	900	895	901	900	920
San Francisco	479	798	824	851	885	883	876	877	921
Seattle	530	789	836	859	857	855	853	882	887
Montreal	408	603	605	630	650	650	649	648	642
Toronto	...	610	671	673	697	692	690	687	691
U. S. Average	**474**	**757**	**794**	**813**	**827**	**831**	**831**	**834**	**850**

Building Cost Index

City	June '49	June '58	June '59	1960 Mar	1960 Jun	1960 Sep	1960 Dec	1961 Mar	1961 Jun
Atlanta	308	461	477	503	498	501	504	504	512
Baltimore	349	527	544	553	562	561	559	560	563
Birmingham	329	480	498	517	518	526	526	527	534
Boston	362	528	560	565	566	567	572	576	588
Chicago	349	535	578	582	594	592	586	580	596
Cincinnati	358	502	529	540	551	549	545	543	552
Cleveland	332	515	554	553	562	560	562	563	574
Dallas	322	459	474	491	519	524	525	527	530
Denver	351	525	537	542	545	551	552	553	554
Detroit	336	545	599	599	608	605	605	605	614
Kansas City	357	527	548	553	562	559	553	553	562
Los Angeles	339	514	552	556	566	569	561	557	570
Minneapolis	361	548	564	570	573	581	576	575	587
New Orleans	325	477	499	514	517	507	508	507	513
New York	398	578	639	646	647	648	645	662	668
Philadelphia	394	569	583	580	585	589	590	589	595
Pittsburgh	375	573	595	609	618	621	626	625	626
St. Louis	375	558	590	579	583	579	576	581	585
San Francisco	341	507	550	553	554	560	553	554	566
Seattle	328	470	499	504	504	506	504	507	515
Montreal	316	449	450	459	466	466	464	464	458
Toronto	...	605	671	495	497	492	492	489	493
U. S. Average	**349**	**521**	**548**	**555**	**561**	**563**	**562**	**562**	**570**

• How to convert ENR Indexes

To convert from 1913=100 base to base year below*	Divide 1913=100 values of Construction Cost Index by...	Divide 1913=100 values of Building Cost Index by...
1949=100	4.7702	3.5179
1947-49=100	4.5033	3.3642
1940=100	2.4196	2.0281
1939=100	2.3551	1.9744

Conversions to other base years are made by simple ratios:

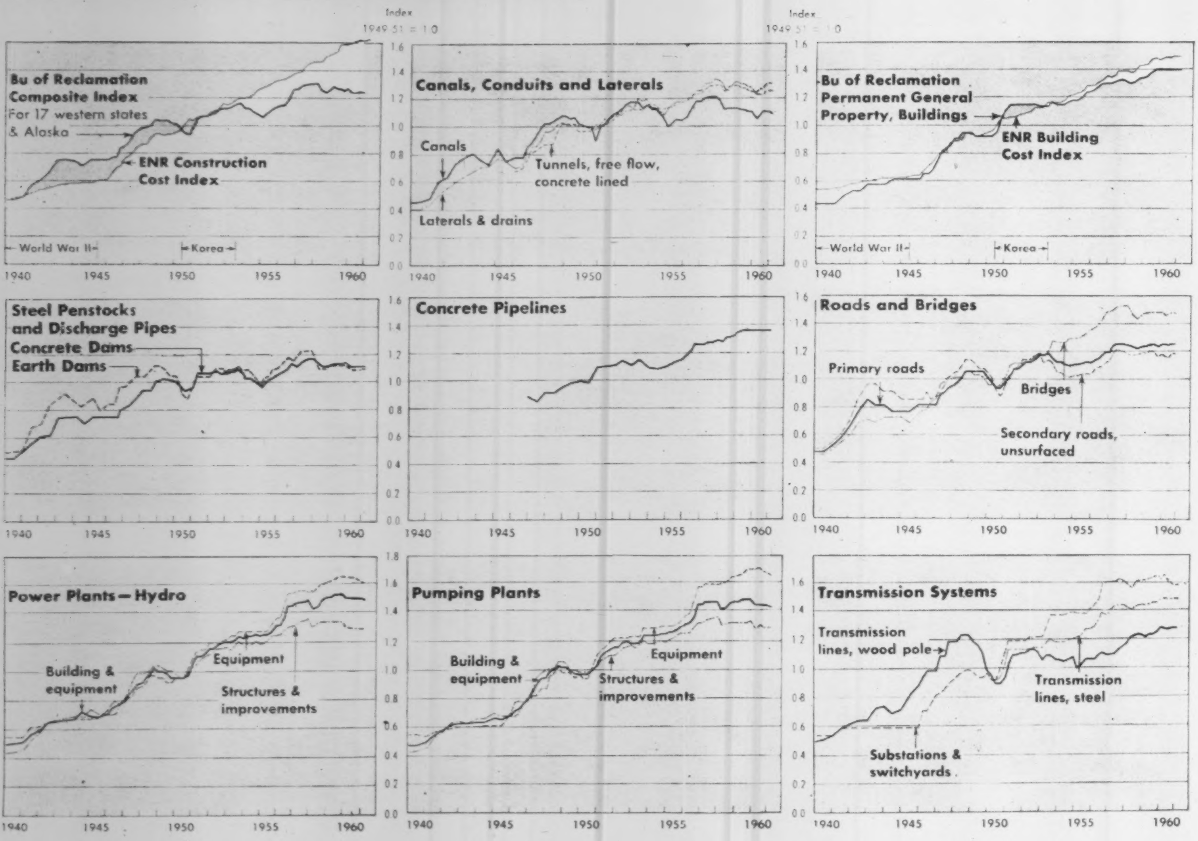
$$I_{nb} = \frac{I_{ob}}{I_{nby}} \times 100$$

where I_{nb} is index on new base
I_{ob} is index value on old base
I_{nby} is old base index value for new base year

* Applies to 20-cities index, not to individual cities

Monthly Index History

Historical record of ENR Cost Indexes, graphs and tables for all years 1913-61 is in the supplement to Engineering News-Record, Mar. 23, 1961. *Reprints are available at $0.50 each from Business News Department, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.*



Irrigation & Hydro Cost Indexes

The "buyer's" cost of irrigation and hydroelectric projects averaged the same in April '61 as in January, U. S. Bureau of Reclamation indexes show. BuRec's composite cost index holds at 1.26 (1949-51 = 1.00). Only one item covered by the index, poles and fixtures for power transmission lines, rose in January-April '61. On the downside were pumping plant equipment, canal earthwork and structures, lateral earthwork, and hydroelectric power-plant equipment.

Between April 1960 and '61, the BuRec index moved up 1.6%, pushed by 2% to 4% increases for canals and conduits and 5%-7% boosts in project buyers' costs for laterals and drains.

That 12-month increase in the BuRec composite index falls short of the 2.8% rise in contractors' basic construction costs in April '60-'61 as measured by the ENR Construction Cost Index. And the BuRec "sub" index for buildings on the projects covered held steady in the past year, while ENR's index of basic building costs moved up 1.8%.

U.S. Bureau of Reclamation Indexes, Denver, Colo., 1949-51 = 1.0

	April							1961	
Class of Construction	1954	1955	1956	1957	1958	1959	1960	Jan	Apr
Composite Index	1.13	1.09	1.16	1.27	1.30	1.26	1.24	1.26	1.26
Dams, earth	1.09	1.03	1.08	1.18	1.17	1.12	1.10	1.09	1.09
Dam structure						0.99	0.95	0.93	0.93
Spillway						1.27	1.25	1.24	1.24
Outlet works						1.34	1.35	1.36	1.36
Dams, concrete	1.04	1.00	1.06	1.14	1.14	1.13	1.12	1.12	1.12
Dams, diversion						1.39	1.39	1.39	1.39
Pumping plants, building & equip	1.24	1.26	1.33	1.45	1.41	1.47	1.44	1.44	1.42
Structure, rein conc, & improv	1.18	1.21	1.25	1.32	1.30	1.33	1.29	1.29	1.29
Equipment	1.29	1.30	1.39	1.58	1.59	1.66	1.70	1.67	1.65
Pumps & prime equipment	1.34	1.35	1.46	1.66	1.67	1.75	1.78	1.74	1.70
Accessory elec & misc equip	1.20	1.20	1.26	1.43	1.44	1.50	1.55	1.55	1.55
Steel penstocks, discharge pipes	1.30	1.34	1.50	1.68	1.66	1.74	1.77	1.78	1.78
Canals	1.13	1.02	1.08	1.20	1.12	1.12	1.06	1.11	1.10
Earthwork						1.06	1.01	1.07	1.05
Structures						1.19	1.12	1.16	1.15
Conduits (tunnels, conc-lined)	1.16	1.15	1.19	1.26	1.25	1.28	1.24	1.27	1.27
Laterals & drains	1.14	1.16	1.19	1.31	1.26	1.30	1.23	1.31	1.31
Earthwork						1.05	0.92	0.98	0.97
Structures						1.52	1.41	1.50	1.50
Power plants, hydro, bldg & equip	1.25	1.26	1.32	1.46	1.42	1.51	1.50	1.50	1.49
Structure, rein conc & improv	1.19	1.20	1.25	1.31	1.30	1.34	1.29	1.30	1.30
Equipment	1.28	1.28	1.37	1.55	1.55	1.62	1.65	1.62	1.60
Turbines & generators	1.31	1.31	1.39	1.58	1.59	1.66	1.68	1.65	1.63
Accessory electrical equip	1.23	1.24	1.30	1.46	1.48	1.52	1.56	1.50	1.48
Miscellaneous equipment	1.17	1.21	1.31	1.44	1.40	1.45	1.49	1.50	1.50
Concrete pipe lines					1.28	1.35	1.36	1.36	1.36
Switchyards & substations	1.37	1.38	1.43	1.60	1.58	1.62	1.63	1.58	1.58
Transmission lines—									
Wood-pole, 115-kv	1.06	1.00	1.06	1.09	1.18	1.21	1.28	1.27	1.27
Poles and fixtures						1.13	1.13	1.10	1.11
Overhead conductors, devices						1.34	1.39	1.40	1.40
Steel-tower, 230 kv	1.18	1.21	1.29	1.39	1.42	1.44	1.48	1.48	1.48
General property—buildings	1.15	1.18	1.26	1.30	1.30	1.36	1.40	1.40	1.40
Primary roads	1.13	1.11	1.14	1.23	1.22	1.25	1.25	1.24	1.24
Secondary roads (unsurfaced)	1.05	1.03	1.07	1.18	1.18	1.20	1.17	1.18	1.18
Bridges, steel	1.27	1.30	1.38	1.48	1.46	1.48	1.46	1.49	1.49

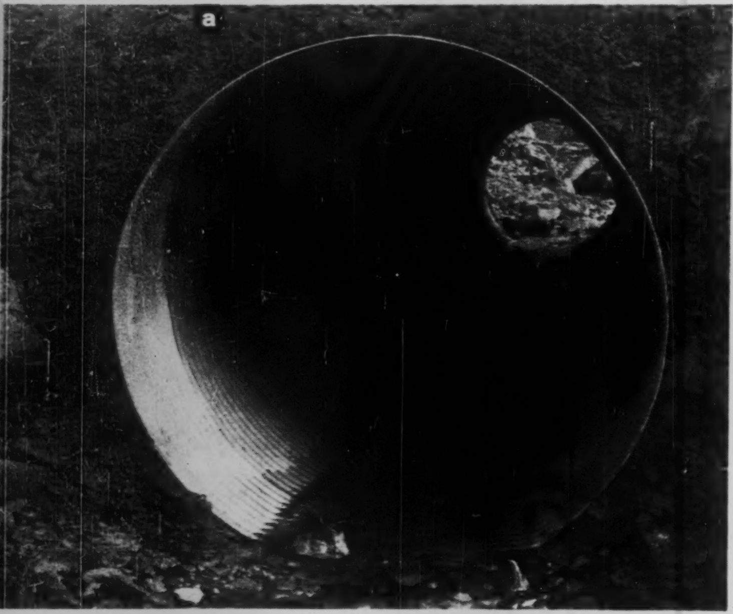
Based on combined costs of material and labor furnished by the contractor, and the government on US Bureau of Reclamation projects in 18 western states including Alaska

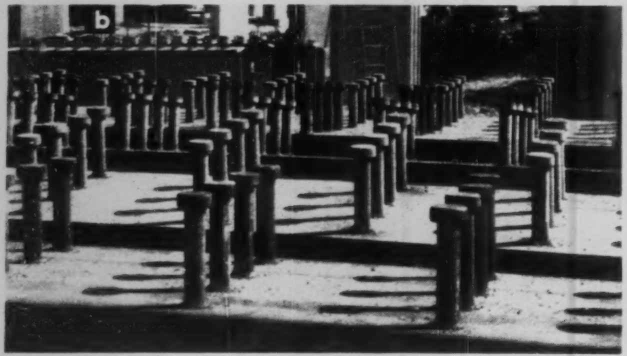
In 1775, Daniel Boone hacked his way through the forests of Kentucky and left a wake that was to become known to pioneers as "Wilderness Road." It was Kentucky's first highway, built by one man's time, courage and energy. Today, thousands of men are still changing Kentucky's terrain, building modern, safe highways of concrete and steel. In the next three years, Kentucky will spend more than $126 million in matching funds on its share of the National System of Interstate Highways. Kentucky has already completed 82 miles of new Interstate roads and another 115 miles are under construction. When completed, Kentucky will have 709 miles of Interstate Highway. For more details on Kentucky's Interstate Highway progress, turn the page. ☞

The strength of Kentucky's Interstate Highway program is steel

More than 160 million cubic yards of dirt will be dug, dozed, drawn and dumped with steel equipment. Power shovels equipped with USS High Strength Steel buckets will shatter mountains of rock and shale. Giant steel tractors and paving equipment will spread more than 17 million square yards of pavement. And for maximum strength, the pavement will be reinforced with steel reinforcing bars or steel fabric. 250 overpasses will depend on the strength of steel for permanence. Rights-of-way will be protected with more than a thousand miles of fencing, almost enough to enclose the whole state. Two million feet of steel guardrail will line the highway. Steel is also used for highway signs, posts and lighting standards.

USS Steel H-Beam Bearing Piles were driven to rock as deep as 105 feet to get a sure footing for four bridges on the Covington-Lexington section of Interstate 75. Kentucky's share of the Nation's 41,000 miles of Interstate Highway is under the direction of Henry Ward, Highway Commissioner, and D. H. Bray, Highway Engineer.





a Steel culvert, below, protects road embankments by shuttling thousands of streams harmlessly underneath. Steel culvert is strong, economical and long lasting. **b** Steel anchors on steel girders (d), hold roadways tight and firm, for composite action. **c** Construction machinery is built from more than 150 varieties of steel for high strength and all-weather performance. Nothing can match the strength and durability of steel for construction equipment. **d** Giant steel girders will keep traffic moving endlessly. Steel bridges outlast everything but route changes. **e** Steel reinforced highways last longer, ride smoother and cost less to maintain. USS reinforcing rod and fabric is made from cold-drawn high strength steel for maximum strength. **f** Highway accessories, guardrails, lighting standards and signs look attractive with minimum maintenance and last for a long time. **g** Proposed interstate highway route locations for Kentucky's 709 miles of the Nation's Interstate Highway Program. **Right,** Governor Bert T. Combs looks over plans for new roads to tie in with Kentucky's share of the Interstate Highway Program. USS and AMERICAN are registered trademarks.

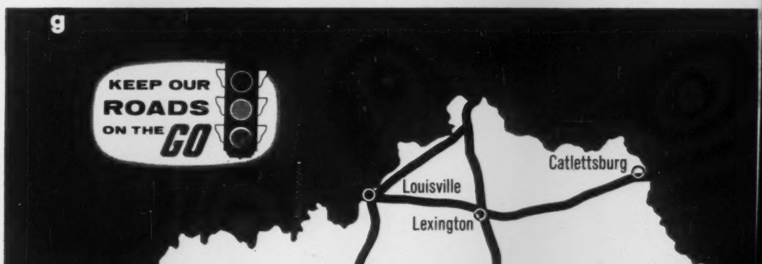
United States Steel

USS

e

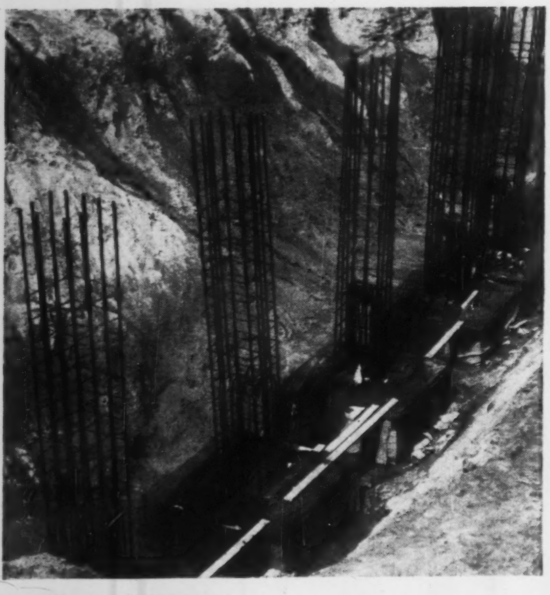
f

g



This mark tells you a product is
made of modern, dependable Steel.

Steel piles, left, being driven for the Covington-Lexington section of Interstate 75. More than 82,000 feet of USS H-Beam Bearing Pile was driven for four bridges in this section. **Completed Interstate,** below, winds through picturesque Kentucky scenery, and every foot of highway is made stronger with steel.



Reinforced concrete pipe is 30% stronger when it's reinforced with USS AMERICAN Welded Wire Fabric. Steel fabric distributes the load evenly and reduces stress about one third. **Reinforcing bars,** right, provide the backbone for bridge superstructure. Every bridge in the Kentucky Interstate Highway Program depends on the strength of steel.

United States Steel

USS

KEEP OUR
ROADS
ON THE GO

Send for U. S. Steel's *free* 54-page booklet, "Keep Our Roads on the Go." It tells how the complete range of highway products and services available from U. S. Steel cut costs and speeds operations in every phase of highway construction. United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

The highway market also is served by the following divisions of United States Steel: American Bridge Division · American Steel and Wire Division · Columbia-Geneva Steel Division · Consolidated Western Steel Division · National Tube Division · Tennessee Coal & Iron Division · Universal Atlas Cement Division · United States Steel Supply Division.

Materials Prices Monthly Market Quotations by ENR Field Reporters

LUMBER, TIMBER, PLYWOOD—*Southern Pine,* bold face, *Douglas Fir,* italic

Item	Unit	Atlanta	Balti-more	Birming-ham	Boston	Chicago	Cin-cinnati	Cleve-land	Dallas	Denver	Detroit	Kansas City	Los Angeles	Minne-apolis	New Orleans	New York	Phila-delphia	Pitts-burgh	St. Louis	San Fran-cisco	Seattle	Montreal	Toronto
LUMBER, TIMBER																							
1x6s4s.......... Pine	Mbf.	−80.00	82.50	86.00	....	−106.00	91.00	96.00	105.50	....	+112.00	101.00	....	110.00	85.00	−95.00b	−94.00	−86.00	+89.00	....	....	79.00c	85.00c
Fir		....	85.00	99.00	....	−102.00	92.00	104.00	....	....	+104.00	101.00	76.00	106.00	84.50	−102.00	−101.00	−100.00	−99.00	−81.00	60.00	....	....
1x8s4s.......... Pine	"	−83.00	85.00	83.00	....	−107.00	93.00	100.00	105.50	....	+114.00	101.00	....	107.50	87.00	−97.00b	−96.00	−86.00	+92.00	....	....	81.00c	90.00c
Fir		....	85.00	89.00	103.00	+105.00	94.00	94.00	....	....	+106.00	101.00	−71.00	107.50	84.50	−104.00	−103.00	−86.00	−102.00	−81.00	65.00	....	....
2x4s4s.......... Pine	"	−80.00	85.00	85.00	95.00b	−108.00	98.00	97.00	107.50	....	+108.00	96.00	....	....	93.00	−98.00b	−97.00	−86.00	95.00	....	....	79.00c	85.00c
Fir		110.00	102.50	108.00	110.00	110.00	110.00	111.00	....	103.50	+115.00	101.00	−86.00	106.50	104.50	−105.00	−104.00	−116.00	+107.00	−89.00	73.00	....	100.00
2x6s4s.......... Pine	"	−81.00	85.00	87.00	95.00b	−108.00	98.00	97.00	107.50	....	+108.00	101.00	....	....	93.00	−98.00b	−97.00	−88.00	93.00	....	....	79.00c	84.00c
Fir		110.00	102.50	108.00	110.00	110.00	110.00	111.00	....	103.50	+109.00	106.00	−85.00	117.00	104.50	−105.00	−104.00	−116.00	106.00	−89.00	73.00	....	105.00
2x8s4s.......... Pine	"	−83.00	90.00	92.00	95.00b	−114.00	98.00	99.00	+126.50	....	+118.00	....	....	....	93.00	−99.00b	−98.00	−92.00	−96.00	....	....	95.00c	89.00c
Fir		110.00	105.00	107.00	110.00	+112.00	110.00	111.00	....	104.00	+118.50	....	−85.00	105.50	106.00	−106.00	−105.00	−116.00	+107.00	−89.00	73.00	....	111.00
2x10s4s.......... Pine	"	−88.00	95.00	98.00	115.00b	−117.00	105.00	104.00	+126.50	....	+122.00	111.00	....	....	100.00	−102.00b	−101.00	−95.00	+105.00	....	....	125.00c	89.00c
Fir		110.00	106.50	111.00	120.00	+118.00	115.00	112.00	....	106.50	+126.00	111.00	−86.00	107.00	107.00	−109.00	−108.00	−118.00	+113.00	−89.00	75.00	....	111.00
3x12Rgh.......... Pine	"	−103.00	110.00	117.00	....	129.00	112.50	....	+139.50	....	....	....	....	....	115.00	115.00	114.00	120.00	120.00	....	....	....	100.00c
Fir		....	120.00	126.00	140.00	+127.00	145.00	127.00	....	124.50	+189.00	131.00	91.00	132.25	122.00	122.00	121.00	134.00	−130.00	−97.00	87.50	....	122.00
6x12Rgh.......... Pine	"	−113.00	130.00	....	....	150.00	112.50	....	171.00	....	....	....	....	....	110.00	118.00	117.00	120.00	−130.00	....	....	....	....
Fir		....	130.00	131.00	150.00	+128.00	145.00	127.00	....	124.50	+189.00	176.00	91.00	123.50	122.00	125.00	124.00	134.00	−130.00	−115.00	91.00	....	122.00
12x12Rgh.......... Pine	"	−128.00	130.00	176.00	....	−150.00	155.00	....	178.00	....	....	....	....	....	120.00	118.00	117.00	120.00	−130.00	....	....	120.00c	....
Fir		....	130.00	181.00	158.00	+128.00	145.00	124.00	....	119.50	+189.00	176.00	−86.00	119.50	112.25	125.00	124.00	127.00	−130.00	−117.00	91.00	....	120.00
FIR PLYWOOD (a)																							
⅝" Int. Plyscored, CD gr..............	Msf.	−140.00	−129.40	−128.47	122.00	+135.00	−128.45	+138.00	123.00	110.25	−128.45	135.00	103.30	117.00	131.55	−124.20	−123.50	−127.50	−125.37	−107.00	104.00	....	158.00
¾" Exterior Plyform, BB gr..............	"	−180.00	104.40	224.71	+216.40	225.00	−214.70	−218.40	210.00	210.00	−209.70	215.00	158.10	+208.05	220.00	−215.60	−214.50	−217.75	−210.93	−188.00	196.00	....	220.00

Fir-Random length, 75% construction grade, 25% standard grade, 30,000 bf delivered by wholesale dealer, green stock, grademarked. Pine-Random length, #2 common and better, Southern Pine Inspection Bureau grademarked, 30,000 bf delivered by wholesale dealer. •a Certificated stock, carlots, fob city. •b Hemlock, 75% construction grade, 25% standard grade. •c Spruce.

WINDOW GLASS, Discounts from Jobber's list, Feb. 1, 1950 (a) sales tax extra—single or double strength

	Atlanta	Balti-more	Birming-ham	Boston	Chicago	Cin-cinnati	Cleve-land	Dallas	Denver	Detroit	Kansas City	Los Angeles	Minne-apolis	New Orleans	New York	Phila-delphia	Pitts-burgh	St. Louis	San Fran-cisco	Seattle	Montreal	Toronto
A quality.........	78%	74%b	82%c	70+10%eg	70%	72%	72-2-10%	70%	73%-10	72-10-10%	76-10-10%	$12.88/17.32	70-10%	76%d	79%	80%	76%	74-10-10%ef	60%	$8.85/11.55di	40-10-5%a	$6.49/9.50
B quality.........	80%d	74%b	83%c	70+10%eg	70%	72%	72-2-10%	70%	73%-10	72-10-10%	76-10-10%	$10.45/14.13	70.10%	76%d	79%	80%	76%	74-10-10%el	73%	6.41/8.07di	40-10-5%a	5.90/8.77

Glass: •a Jobber's list price per box, 14 x 20, ss. $42.75 for A quality, $37.50 for B quality; 14 x 20, ds. $60.00 for A quality, $52.75 for B quality. •b sales tax extra. •c 77% for single strength. •d From 6/15/52 list. •e 77% for double strength. •f Single strength; double strength, 83%. •g From 8/1/58 list. •h ss/ds, 40-in. •i 20 boxes min. •l eff. 10/15/58. •m less 2% disc, 10 days. •n less 1% disc, 10 days. •o add 2% sales tax. •p less 1% for cash. •q less 2% for cash.

EXPLOSIVES per lb, 40% Ammonia Gelatin in 50 lb cases delivered in 500 lb lots (non-seismograph grades)

Urban Areas	Atlanta	Balti-more	Birming-ham	Boston	Chicago	Cin-cinnati	Cleve-land	Dallas	Denver	Detroit	Kansas City	Los Angeles	Minne-apolis	New Orleans	New York	Phila-delphia	Pitts-burgh	St. Louis	San Fran-cisco	Seattle	Montreal	Toronto
	$0.2595	$0.2795	$0.2595	$0.2795	$0.2795	$0.2595	$0.2595	$0.2870	$0.2795	$0.2795	$0.2795	$0.2795	$0.2795	$0.2795	$0.5130g	$0.2795	$0.2595	$0.2795	$0.2795	$0.2795	$23.20h	....

Explosives: Cartridges of 1¼" diameter or over, in standard lengths. •g deliveries in certain areas must be by truck or by truck and boat, requiring extra charge. •h fob Beloeil (near Montreal), per 100 lb., lots under 2000#, wood cases, forcite, 40%. Forcite 60% $24.30 in fiber cases; forcite 40%, $24.05; forcite 60%, $25.80. Price of 60% Ammonia Gelatin is $0.15 per lb. higher than 40% in U. S., $1.75 per 100 lbs. higher in Canada.

Non-Urban Areas	C/L 30,000 lb. lots	10,000 lb. lots	2,000 lb. lots	200 lb. lots
Group 1*............	$0.21.95	$0.22.95	$0.26.45	$0.27.95
Group 2†............	.22.70	.23.70	.27.20	.28.70

*All areas except those in Group 2 and N.J. cities of Bayonne, Hoboken, Jersey City, No. Bergen, Union City and Weehawken † Florida counties of Manatee, Hardee, Highlands, Okeechobee, St. Lucie and south thereof; Idaho; Maine; Montana; New Mexico counties of Catron, Socorro, Lincoln, De Baca, Roosevelt and south thereof; Texas counties of Bailey, Lamb, Hale, Floyd, Motley, Cottle, Hardeman, Foard, Knox, Haskell, Jones, Taylor, Coleman, McCulloch, San Saba, Burnet, Williamson, Milan Robertson, Leon, Houston, Angelina, Nacogdoches, Shelby and south thereof.

PILES prices per linear foot, fob cars, New York

Dimensions	Points	Length	—By Rail— Pine*§	Fir
12" at butt............	6-in.	30 to 39-ft.	$0.42a	....
12"—2-ft. from butt....	6-in.	40 to 44-ft.	.91	....
12"—2-ft. from butt....	6-in.	45 to 49-ft.	.97	....
12"—2-ft. from butt....	6-in.	50 to 54-ft.	1.01	....
12"—2-ft. from butt....	6-in.	55 to 59-ft.	1.07	....
14"—2-ft. from butt...	6-in.	65 to 69-ft.	1.21	....
14"—2.ft. from butt....	6-in.	70 to 74-ft.	1.34	$1.40
14"—2-ft. from butt...	6-in.	75 to 79-ft.	1.41	1.40
14"—2-ft. from butt...	5-in.	80 to 84-ft.	1.54	1.45
14"—2-ft. from butt...	5-in.	85 to 89-ft.	1.67	1.54

* Pine piling over 90 feet available only in limited quantities. § ASTM Class B •a, trucked in from N. J.
Prices per linear foot, fir and pine, rough peeled, f.o.b. cars, New York. Fir based on Wash. and Ore. points to New York shipping area; pine under fifty feet based on freight from mid/South, over fifty feet on freight from deep south.

CHEMICALS Water, sewage treatment, road work, carlots, f.o.b. works

Chlorine cylinders, liquid, per lb. freight allowed, N. Y. State............	$ .11
Calcium chloride, 77-80%, flaked, 100-lb. paper bag, ton..............	32.00
Silicate of soda, 52 deg., in drums, per 100 lb..................	2.65
Soda ash, 58%, in paper bags, per 100 lb. dense..........	1.90
Sulphate of aluminum, commercial, in 100-lb. bags..........	2.05
Sulphate of copper in bags, 99% per 100 lb., reg., 25.2% copper content.....	13.00

RAILWAY TIES

Prices f.o.b. per tie box carload lots:

		6" x 8" x 8' Untr.	Tr.	7" x 8" x 8'6" Untr.	Tr.
Birmingham*..................	Hardwood, Grade 3............	$1.70	$2.55	Gr. 5 $2.25	$3.33
	Grade 2............	1.50	2.35	" 4 2.10	3.18
	Grade 1............	1.15	2.00	" 3a 1.70	2.78
Chicago..................	Red Oak..................	2.85–3.00	4.00a–4.10	3.90	4.75–5.00
New York..................	Mixed Hardwood..............	3.45	5.10	4.30	6.50
	Mixed Oak..................	3.55	5.20	4.40	6.60
Philadelphia..................	Mixed Oak..................	3.80	3.97	4.37	4.57
St. Louis..................	Mixed Oak..................	2.65	3.65	3.05	4.10
San Francisco..................	Douglas Fir..................	2.32ef	3.75e	2.70ef	3.80ca

Tr.—Treated; Untr.—Untreated. •a Creosoted. •c Empty cell. •e Green •f f.o.b. cars. •g 7 x 9 x 8'6" * Add 75¢/tie freight charge to Birmingham. •h 7" x 9" x 8½. •l Mixed Hardwood

See following ENR issues for OTHER PRICES:

- Clay Products, Lime, Plaster, Paint Roofing: Last, May 25: Next, June 29.
- Wage Rates, Building Board, Lath, Insulation: Last, June 1; Next, June 29.
- Cement Aggregate, Ready-Mixed Concrete: Asphalt: Last, June 8: Next, July 6.
- Iron & Steel Products, Pipe: Last, June 15: Next, July 13.

Automation gains on highway bid evaluation and cost analysis, but . . .

States Report Computer Growing Pains

"We have come a long way in computer use. Every step we take seems to open two more possibilities."

That's a Pennsylvania Department of Highways spokesman talking, but his is a good description of what is happening across the country in the use of computers for highway administration.

(For how highway engineers are using computers in design see p. 69.)

To date 31 states are evaluating bids on their computers (two of these are conventional, not electronic); 18 states are processing bid price feed-back data; 18 are computing bid price indexes; 10 cost feed-back on highway maintenance work; 21 have computer control of their equipment inventory and management; and 19 are getting automated equipment maintenance and repair costs and operating data on costs, time or mileage.

Other states are awaiting delivery of a new computer or a larger machine, or card equipment to make a present tape unit more flexible for data processing. Some need more time for programming or more experienced programmers.

Only 15 states report no immediate plans to automate bid evaluation; only 17 are not planning to process bid prices electronically; only 19 are not using computers for equipment inventory and cost control.

Additional, off-beat uses include: Idaho's pipe summary to maintain an "equitable balance" between metal and concrete; Nebraska's bid tabulation listings for contractor subscribers; Maryland's compilation of prices for estimating consultant's fees; Florida's preprinting of monthly itemized estimates of construction. Illinois is programming for a new IBM 1401 computer "with many pioneer aspects" which they plan to announce soon. Minnesota will do an "award bid price report—when specifications stabilize."

Most states develop their own coding system, but some say theirs are essentially the same as the accounting code of the American Association of State Highway Officials.

• Computer advantages, disadvantages— Computer advantages obviously outweigh the disadvantages, and they line up in this order for bid and cost analysis: accuracy; speed (time saving); timeliness; reduced paper or clerical work (man-hours); reduced cost; additional information not otherwise practical; saving of time of engineering staff; reduction of voluminous detail to concise reports; awarding of contracts the day bids are opened; easier access to records; flexibility, faster results and better control on information.

Wisconsin, on an experimental bid evaluation since January, reports that tabulating bids can be advantageous only if the card decks can be used to advantage for progress or final payment or for cost data feedback. Some of the smaller states report that "You gotta have volume!" to reap the advantages.

What Highway Departments Do on Electronic Computers

Summary——————

Function:	Code	Number of States Doing now	Planning to do	Not doing
Evaluating bids	E	31	3	15
Monthly progress reports	Mo	6	3	..
Final payment	F	7	1	..
Costs: Feedback or averages	A	18	6	17
Indexes	I	18	2	..
BPR data	R	7	..	..
Maintenance work	M	10	2	..
Equipment:				
Inventory control, & management	In	21	6	19
Costs, operating	O	19	4	..
Maint. & repair	M	19	4	..

No answer from North Carolina, West Virginia
Results for other states follow:

By State———

	Bid evaluation, plus	Costs feedback, indexes	Equipment inventory control, costs
Alabama	E	M	In O M
Alaska	no	no	no
Arizona	no	no	no
Arkansas	E	no	In O M
California	no	no pM	no
Colorado	E F	A I M	In O M
Connecticut	E Mo F	A I R	In O
District of Columbia	no p	no p	no
Delaware	no	no	no
Florida	E	I M	In O M
Georgia	no	no	no
Hawaii	E Mo F	no p	no
Idaho	E	A I R	pIn pO pM
Illinois	E Mo F	A pM	pIn pO pM
Indiana	E	A	no
Iowa	no p	no	In O M
Kansas	E	A I	In O M
Kentucky	E	A I R M	In O M
Louisiana	E pMo	no	M
Maine	no	no	no
Maryland	E	A I M	In O M
Massachusetts	no	no	no
Michigan	E Mo F	A I	no
Minnesota	E	pA M	In O M
Mississippi	E	A	no
Missouri	E	A I	no
Montana	E	A I R	no p
Nebraska	E	A I	O M
Nevada	no	no	In O M
New Hampshire	no	no	no
New Jersey	no	no	In
New Mexico	E	I M	In O M
New York	E pMo	A I	In pO pM
North Carolina	not ans		
North Dakota C	no	A	In O M
Ohio	E Mo F	A	no
Oklahoma	E	A I R M	In O M
Oregon	E Mo F	A I M	In O M
Pennsylvania	no	M	In O M
Rhode Island	no	no	no
South Carolina	no pE	no	pIn pO pM
South Dakota C	no	I R	In O M
Tennessee	E pMo pF	pA pI	no p
Texas	E	pA pI	In
Utah	E	I	pIn
Vermont	no	no	no
Virginia	E	no	In
Washington	E	I	no
West Virginia	not ans		
Wisconsin	E	no	O M
Wyoming	E	pA	O M

C Conventional, not electronic equipment
p Being programmed, in planning stage, under development hope to soon, under consideration

For equipment management these are the advantages cited: better information for replacing equipment; ability to spot excess repairs, faulty operators, faulty maintenance; equipment cost records can tie into construction, maintenance and design cost records; user can prorate rental so each type of equipment can earn actual cost; operating data by number of miles or number of hours; utilization data on mobile equipment; operating efficiency; speed in up-dating inventory at depreciated value; current and accumulated costs by year and life of equipment in order, by class and unit.

Most of the disadvantages stem from the growing pains and are considered curable. Headaches include: the "auditing" required for source data or the hand manipulation that is necessary; the large amount of data processing in the input stage; miscoding or coding repairs; difficulty in checking errors confined to long accumulations; delay in correcting errors (in subsequent period, or next run, whereas manually they could be corrected at once); delay due to priorities assigned to other work; obtaining help for system development and programming; training personnel; card volume required to maintain records; programming problems to get desired flexibility, difficulties encountered in getting uniform bid items and specifications.

Montana tested but stopped a program on monthly progress payments because additional work orders, materials in and out of storage and other irregularities "made typewriters out of the computers."

Colorado says:

"Computer application in highway work is expected to increase with intelligent programming for years to come."

Oklahoma sums up the state of the automation art this way:

"The maximum advantage of the electrical equipment will be reached only when all personnel concerned have been educated to its potential."

Kentucky says it this way:

"It is doubtful if the average highway management could operate successfully without the large volume of data furnished by the computer and associated data processing equipment."

LINCOLN LUBROVANS and LUBMOBILES Keep the Southwest Boom ON THE MOVE!

5
4
6
3
2
1
9
7
8
10

Four *billion* dollars in construction awards in 1960 . . . and more to come in '61. Thousands of projects ranging from small buildings to missile bases to complex freeways to enormous dams. That's the story of the Southwest's incredible construction boom.

Imagine the equipment it takes to keep these projects moving! And remember that this equipment requires attention and maintenance . . . including lubrication.

Many progressive contractors on these big jobs bring lubrication right to the jobsite with Lincoln Lubrovans and Lubmobiles. These portable lube and fuel rigs are custom-assembled from standard components: hose, reels, pumps, compressors, lubricant drums, etc. They can be arranged in any combination from the simplest to the most involved.

Lincoln's equipment catalog and manual illustrate typical rig installations —show you how you yourself can design the rig you need, and even alter it for different construction jobs. Write for this material today. EN-5

C8102

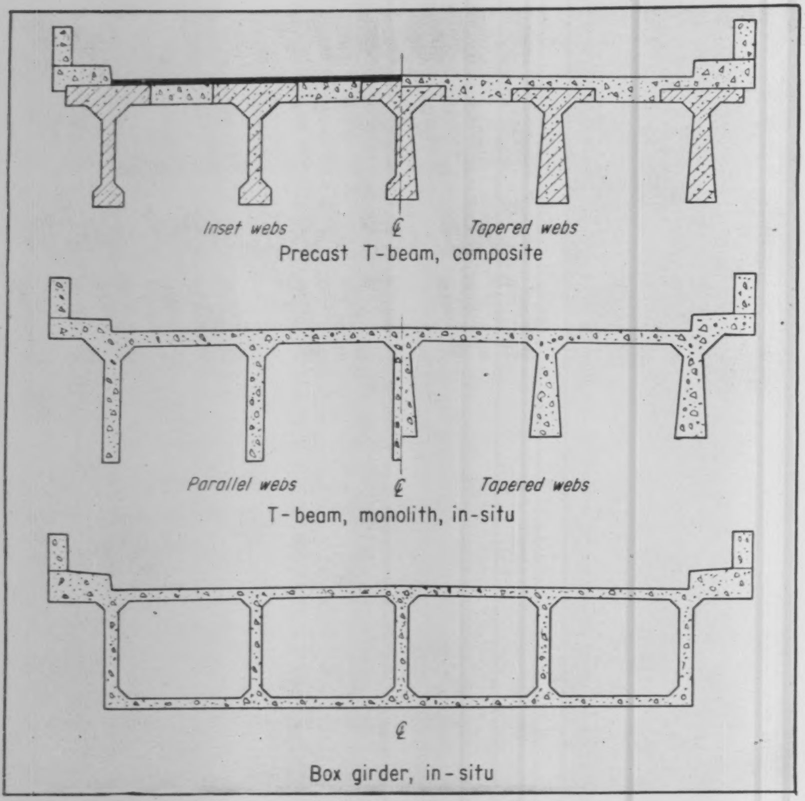
Custom-Assembled Portable Lube Rigs Meet the Need of Every Fast-Moving Construction Job

SOME MAJOR CONSTRUCTION JOBS SERVED BY LINCOLN PORTABLE LUBE RIGS

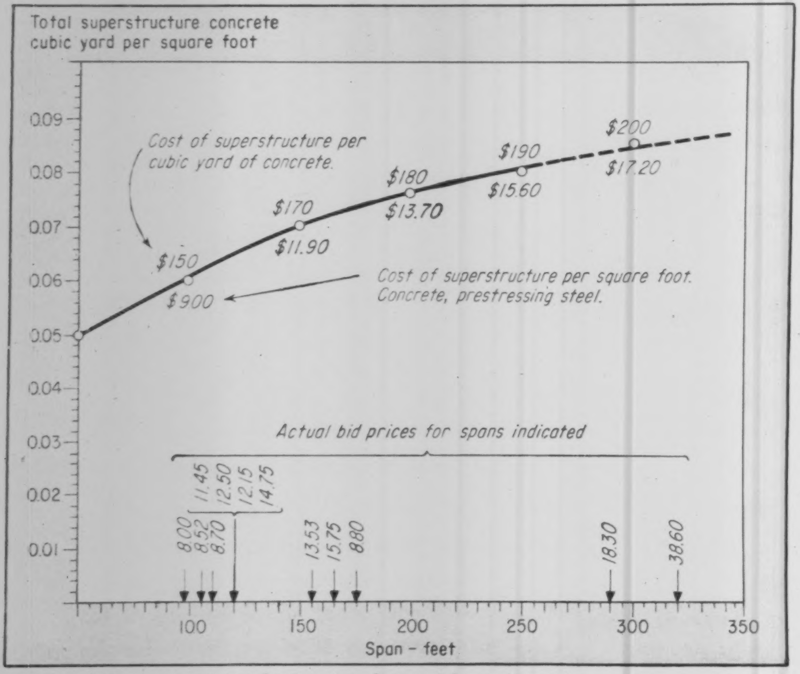
1. Santa Monica Freeway, viaducts
2. Marina del Rey boat harbor
3. Encino Dam enlargement
4. Vandenberg-Arguello missile sites
5. Highway 99, Bakersfield
6. Baker Grade, Las Vegas Highway
7. San Diego Freeway exchange
8. El Cajon Freeway
9. Phoenix Interstate Freeway
10. Navajo Dam

LINCOLN
ENGINEERING COMPANY
4010 GOODFELLOW BLVD., ST. LOUIS 20, MO.
DIVISION OF THE McNEIL MACHINE & ENGINEERING CO.

Analyzing Actual Costs of



CROSS SECTIONS of longer span bridges reveal variety of types.



CURVE defines general trend of cost and material requirements.

By Murray Schupack

In the last ten years contractors have bid a number of prestressed concrete bridge projects in the U. S. with individual spans of 100 ft or more. Sufficient information is now available to tabulate cost and material requirements for some of these longer span structures and to permit detection of general cost trends.

The table, at right, gives general information on bridges that have been built or are under construction. Structures in the Pacific Coast area are not included, but the tabulation of prestressed bridges includes one major bridge in Canada.

The drawing at the left shows the cross-section types covered. Designers introduced continuity into the 320-ft span Lake Oneida bridge; all others included in this survey are non-continuous structures.

Contractors built these bridges with their own forces, except for the Platte River bridge; fabrication of the precast I-beams for this 1,320-ft bridge were subcontracted to an established prestressing plant.

The curve on the chart gives the general range of quantities that can be expected for prestressed concrete bridges for spans up to 300 ft. Quantities are based on designs.

Figures above the curve (at 50-ft intervals) indicate the expected bid price per cu yd for the superstructure concrete, including all reinforcing and prestressing steel, bearings and joints. This does not include bridge rails, wearing surface or any kind of special appurtenances.

Figures below the curve (also at 50-ft intervals) indicate the cost per sq ft of these spans, based on the cu yd cost and the quantities given by the generalized curve.

Note that the curve is a generalized one that gives an indication of the general range of cost and quantities for bridges constructed with usual depth-span ratios and at average construction sites.

The curve does not reflect much repetition of spans where maximum re-use of plant would be possible.

Also shown on the chart are the prices per sq ft for bridges that have been bid, as given in the table. The

---

***Consulting Engineer Schupack**—of Schupack and Zollman, Stamford, Conn.—is an authority on prestressed concrete bridges. His firm designed several of the structures covered in the article.*

Prestressed Bridges

320-ft span structure, the Oneida Lake Bridge, is a very special bridge with depth-span ratio of 1 to 40.

The cost trend shown may assist the engineer in evaluating design possibilities for a particular structure. Since information on this type of structure is still scarce, the curve should be used judiciously.

The chart and its curve apply to simple span bridges up to possibly 180 ft long.

It is likely that designers would utilize continuity for spans over 150 ft, if span relationships were suitable. For spans longer than 200 ft, continuity would in all probability be an economic necessity.

Some of the bridges tabulated are being built by the same construction techniques used for conventional reinforced concrete structures. The only differences are in the incorporation of the prestressing cables and the use of higher strength concrete.

Concrete strength requirements have not been a problem on any of these bridges, due largely to careful inspection that has been used for all the structures shown here.

It is hoped that these data will be extended in the near future. The writer will appreciate receiving pertinent information from designers or owners of any structures that have been omitted or of any prestressed concrete bridges mentioned here for which new information becomes available.

Bid Costs & Materials For 15 Prestressed Bridges

BRIDGE	DATE BID	SPANS FT.	DEPTH/SPAN RATIO	DECK AREA SQ. FT.	TYPE	SUPERSTRUCTURE		
						CONCRETE C.Y./SQ. FT.	COST* $ SQ. FT.	COST* $ C.Y.
WALNUT LANE Philadelphia, Pa.	1949	1 @ 160 2 @ 74	1/24 1/11	19,600	Precast T-Beam Composite	.....	20.20	...
GORGAS LANE Philadelphia, Pa. (1500′ Radius Curve)	May 1956	5 @ 120 2 @ 70	1/17 1/10	50,000	Parallel web T-Beam Monolith Insitu	.072	11.45	160
CAPTAIN JOHN BISSEL Windsor, Conn.	Nov. 1956	14 @ 120	1/17	128,000	Parallel web T-Beam Monolith Insitu	0.070	12.50	180
AIR FORCE ACADEMY BRIDGES Colorado Springs, Colo.	Dec. 1956	23 @ 120	1/17	120,400	Tapered web Precast T-Beam Composite	0.074	12.15	165
MONTROSE AVENUE Cook County, Ill. (46° skew)	Nov. 1957	3 @ 154	1/22	37,000	Tapered web T-Beam Monolith Insitu	0.076	13.53	180
JAMES RIVER Virginia (H15 Loading)	Jan. 1958	9 @ 100 2 @ 70	1/17 1/12	34,500	Parallel web T-Beam Monolith Insitu	0.060	7.55	125
ONEIDA LAKE Syracuse, N. Y.	1958	79 320 79	1/40 @ Midspan	43,000	Counter-weighted Precast Inset T 3 Span Continuous	0.085 0.099	38.60	210
WENTWORTH AVENUE Cook County, Ill. (22° skew)	March 1960	1 @ 117 1 @ 91 1 @ 101	1/25 1/19 1/22	25,600	Tapered web T-Beam Monolith Insitu	0.070	8.52	120
MELROSE STREET Rensselaer Co. New York	Feb. 1960	1 @ 120	1/24	4,000	Precast Adjacent T-Beams	0.067	14.75	220
CHAMPLAIN BRIDGE Montreal, Canada	May 1959	46 @ 176	1/18	637,000	Precast Inset T-Beam Composite	0.063	8.80	140
OAHE RESERVOIR INTAKE BRIDGE Pierre, S. Dakota	July 1960	5 @ 150 3 @ 110 3 @ 70	1/21 1/19 1/15	31,000	Precast Inset T-Beam Composite	.....	18.70†	...
PLATTE RIVER Ashland, Nebraska	April 1960	14 @ 110	1/20	107,000	Precast I-Beam Composite	0.067	8.70	130
14TH STREET** Washington, D. C.	Nov. 1959	12 @ 165	1/24	121,600	Box Girders Insitu	0.079	15.75	200
CABIN JOHN** Shore Spans Maryland	June 1960	3 @ 163 2 @ 103	1/19 1/17	69,200	Parallel web T-Beam Monolith Insitu	0.071	13.50	190
CABIN JOHN** River Spans Maryland	June 1960	211 280 211	1/32@ Midspan 1/16@ Pier	69,500	Spread Box Girder Insitu Anchor Spans. Welded Steel Suspended Span	.....	18.30	...

* Superstructure cost includes concrete, prestressing steel, reinforcing steel, and structural steel only. All loading is H20-S16, except James River Bridge, which is H15-44.

† Cost includes Total Superstructure and Dam Appurtenances.

* Bid unsuccessfully against steel. Steel prices: 14th Street, 22¢/lb; Cabin John shore spans, 18.9¢; Cabin John River spans, 8.9¢.

"Call FOSTER get pipe for piling PLUS"

Order pipe piles from Foster and get the right type, in the exact diameter and wall thicknesses you need . . . "plus" fast, on-time deliveries.

Another plus: you get your pipe piles cut to length—no wasteful cutoffs, and a fraction of the usual splices.

Foster's nationwide warehouses stock every kind of pipe piling: economical thin-wall spiral-weld, electricweld, lap-weld, seamless, in all diameters and walls. For foundation pipe, Rental Steel-Sheet Piling, Foster Lightweight Piling, Driving Accessories, and other construction and highway products, call your nearest Foster office.

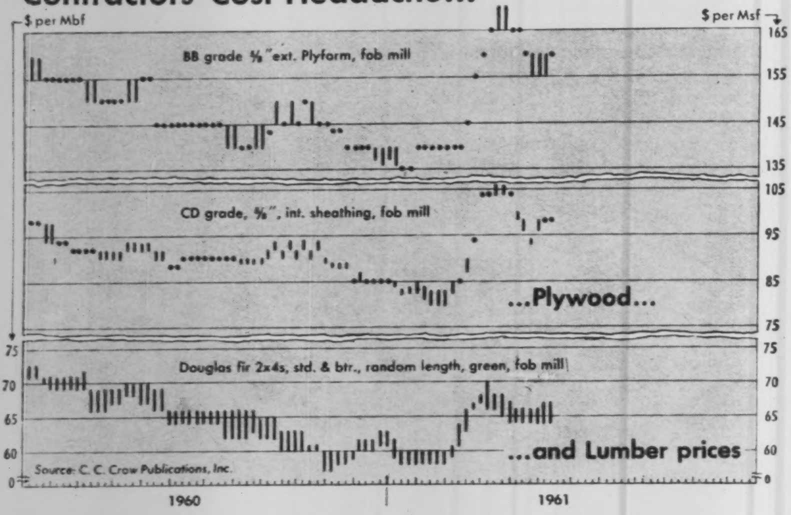
Write **L. B. FOSTER CO.** for
Pipe Piling Catalog EP-6B
Pittsburgh 30, Chicago 4, Houston 2
New York 7, Los Angeles 5, Atlanta 8
Cleveland 35

Faster From Foster

Piling • Pipe • Rail

What's Happening to the

Contractors' Cost Headache...



Source: C. C. Crow Publications, Inc.

MATERIALS: Some Prices Up

In addition to the sudden surge in lumber prices during the second quarter (p. 81), contractors also had to worry about a dramatic turn-around in the long-sick plywood market.

In just five weeks, in March and April, plywood sheathing soared 30% and 16% was tacked onto the cost of plywood for concrete form work. Much of the demand for these key construction materials stemmed from inventory replenishment and speculative buying by wholesale dealers who were looking for a rapid end of the economic slowdown and a quickening pace in home building.

There was also a good deal of demand from dealers who were buying to cover delivery commitments they had made to builders when the market was at last winter's low level.

When this demand was filled, prices gave up part of the spectacular gains of early spring. But, at present levels, there is good demand for both sheathing and Plyform. And producers appear to be making every effort to adjust their production to real demand rather than flooding the market.

It would be smart to figure on seeing plywood prices again nudge the top of the chart before ENR's next quarterly cost report is published.

Most other key materials prices regularly covered by ENR held steady in the second quarter. A notable exception, however, was 12-in. clay sewer pipe, which averaged 7% higher in ENR's 20 cities.

"List" prices of steel reinforcing bars held steady in the second quarter. But few steelmen even bothered to deny that these prices were pretty much fictitious, that a big contractor could make a "deal" without too much strain. This was particularly true in the South, where smaller mills were forced to cut prices to meet competition from European imports, selling 25% to 30% under domestic "lists."

This price-cutting situation was "formally" recognized last week when U. S. Steel Corp. tore up its entire rebar price list and announced that it will quote prices from now on only in response to "individual and specific inquiries."

Even if structural shape mill prices increase later this year (p. 81), steel producers will probably find competition from bar imports too hot to permit a similar boost in rebar prices.

MONEY: Higher Costs Ahead

Under the pressure of Federal Reserve Board purchases of intermediate and some long-term U.S. government bonds, yields on these prime securities and other top grade bonds slipped in the second quarter.

What the Fed was doing was cooperating with President Kennedy's wish to cut long-term interest rates. However, in doing this, it wanted to steer clear of bond price "pegging" operation, preferring to "nudge" bond prices up, yields down.

With the economy rapidly emerging from the recession "nudging" wasn't quite enough to hold down yields. In early June, the U.S. government bond market cracked sharply. Although there has been some recovery, and the Fed's buying is still a market factor, yields on U.S. bonds appear to be headed higher, carrying along yields on municipal and prime industrials.

Borrowing Cost Trends

'.ong-Term Bonds*

Year		US Treas. %	(Per cent yield to maturity) Munici-pal %	Indus-trial %	Public Utility %	Rail-road %
1929		3.60	4.27	5.04	4.96	4.67
1931		3.34	4.01	4.79	4.57	4.42
1939		2.41	2.76	2.64	2.83	3.39
1945		2.34	1.67	2.50	2.59	2.75
1946		2.19	1.64	2.44	2.50	2.59
1949		2.28	2.21	2.53	2.69	2.71
1957		3.47	3.60	3.80	3.99	3.94
1958		3.23	3.56	3.65	3.86	3.89
1959		4.10	3.95	4.25	4.49	4.41
1960	Aver	3.99	3.73	4.26	4.51	4.46
	Jun	3.93	3.78	4.30	4.55	4.47
	Jul	3.78	3.72	4.25	4.48	4.44
	Aug	3.71	3.53	4.10	4.37	4.34
	Sep	3.72	3.53	4.09	4.35	4.29
	Oct	3.85	3.59	4.15	4.43	4.32
	Nov	3.88	3.46	4.18	4.48	4.35
	Dec	3.87	3.45	4.23	4.52	4.37
1961:	Jan	3.87	3.44	4.16	4.47	4.35
	Feb	3.78	3.33	4.12	4.40	4.31
	Mar	3.76	3.38	4.07	4.35	4.25
	Apr	3.79	3.44	4.13	4.43	4.26
	May	3.72	3.37	4.15	4.44	4.30

Short-Term Business Loans#

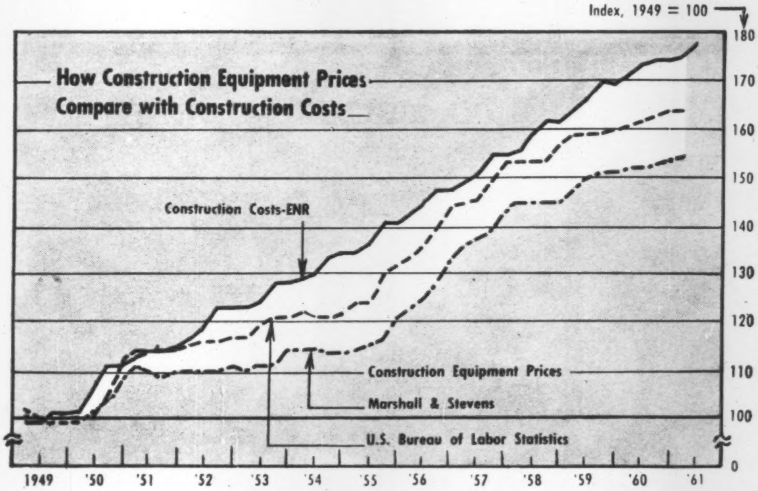
Year		New York City %	7 Other Northern & Eastern Cities %	11 Southern & Western Cities %
1929		5.76	5.82	5.93
1931		3.82	4.26	4.90
1939		2.15	3.05	3.62
1945		2.20	2.55	2.80
1946		1.84	2.51	2.97
1949		2.35	2.86	3.17
1957		4.23	4.39	4.65
1958		4.12	4.34	4.67
1959		4.84	5.01	5.23
1960		4.97	5.15	5.45
1958:	Jun	3.88	4.17	4.58
	Sep	4.00	4.21	4.54
	Dec	4.29	4.50	4.79
1959:	Mar	4.29	4.49	4.84
	Jun	4.71	4.90	5.07
	Sep	5.15	5.27	5.44
	Dec	5.19	5.39	5.56
1960:	Mar	5.18	5.34	5.57
	Jun	5.19	5.34	5.58
	Sep	4.74	4.96	5.32
	Dec	4.77	4.97	5.33
	Mar	4.75	4.97	5.29

*** Standard & Poor's data: Taxable Treasury bonds (Federal Reserve Bd. series on partially tax exempt bonds shown for years 1929-39 had 1945 value of 1.66%); high grade municipal bonds; A1+grade industrial, utility and railroad bonds.**

# Federal Reserve Board data for June. New Series 1949 to date; two former series cover up to 1938 and 1939-48 and are not strictly comparable.

Four 'Ms'

Costs Roundup—2nd Quarter



MACHINES: List Prices Set Record

List prices of new construction equipment have kept nudging to all-time highs for over a year despite sluggish equipment sales. In only four of the last 12 months did the U.S. Bureau of Labor Statistics index of construction equipment manufacturers' list prices fail to set a new record. And in only one month of the last 12, was there a decline in the index.

By April '61, the latest BLS index available stood at 178.2, highest in history and 2% over its value last June. The BLS index is based on average list prices in 1947-49 as 100.

Compared with April 1960, the BLS "sub" index for large portable air compressors (over 200 cfm) registered the largest advance of any item, 10%. The index for compressors of less than 200 cfm capacity moved up 7.7%.

Cable control dozer units are up 6.7% since last April. And hydraulic control dozers are 7.9% higher.

Other significant advances since April 1960 are 5.4% in the "sub" index for bituminous spreaders, a 5.2% increase for trailer dump wagons.

Largest decline in the BLS equipment price indexes came in the 3-3½ cy power shovel group, down 4.8% since April of last year. Other items on the downside; truck mounted cranes; light-medium graders; small dewatering pumps; concrete mixers, finishers and spreaders, and bituminous distributors.

Construction Equipment Price Indexes

U.S. Bureau of Labor Statistics—1947-49=100

	Apr. 15 1961	Apr. 15 1960	Apr. 15 1959	% Change (Apr. to Apr. '60-'61
All Types of Equipment	178.2	174.7	172.0	+2.0
Cranes, Draglines, Shovel	173.9	172.5	169.2	+0.8
Shovel, ½ cy	173.1	167.7	157.8	+3.2
Shovel, ¾ cy	178.2	175.7	172.5	+1.4
Shovel, 1-1½ cy	191.0	188.6	184.6	+1.3
Shovel, 2-2½ cy	169.1	166.4	162.1	+1.6
Shovel 3-3½ cy	159.8	167.8	167.8	−4.8
Shovel, 6 cy	197.9	195.0	188.2	+1.5
Crane, truck mounted	165.9	168.2	169.6	−1.4
Crane, tractor mounted	135.1	135.1	135.1	0
Bucket, clam shell	162.9	162.9	157.7	0
Bucket, dragline	169.3	169.3	169.3	0
Scrapers and Graders	166.6	165.2	165.7	+0.8
Scraper,				
4-wheel, 8-10.5 cy	155.0	155.0	155.0	0
4-wheel, 12-15 cy	156.8	156.8	156.8	0
2-wheel, 15-19.5 cy (a)	126.2	124.9	123.7	+1.0
Grader, heavy duty	174.1	173.1	172.6	+0.6
Grader, light medium	170.9	171.1	171.1	−0.1
Tractors (non-farm)	195.7	191.2	187.8	+2.4
Wheel-type, off-hwy (a)	129.2	129.2	128.2	0
Crawler under 49 dhp	200.4	195.4	188.8	+2.6
50-74 dhp	205.3	195.4	191.9	+4.9
75-99 dhp	204.8	201.2	196.4	+1.7
100-154 dhp	200.2	194.2	191.3	+3.1
155-200 dhp	208.6	203.3	201.3	+2.6
Machinery, Tractor Mtd	177.3	169.2	168.6	+4.8
Dozer, cable control	164.8	154.4	154.4	+6.7
Dozer, hydraulic control	201.4	186.6	186.6	+7.9
Cable power control unit	152.9	152.9	151.4	0
Loader, shovel type	166.5	162.5	161.5	+2.4
Specialized Machinery	158.8	157.8	154.5	+0.6
Ditcher	153.8	150.2	156.6	+2.3
Roller, tandem	228.5	226.4	206.1	+0.9
Roller, 3 wheels	178.7	178.7	170.2	0
Ripper and rooter	164.5	156.6	150.5	+5.0
Dewaterg pump, 10 Mgph	110.1	111.5	110.0	−1.3
Dewaterg pump, 90 Mgph	151.8	151.5	148.6	+0.1
Portable Air Compressors	182.6	167.5	167.5	+9.0
Capacity, under 200 cfm	186.6	173.2	173.2	+7.7
Capacity, over 200 cfm	178.6	162.4	162.4	+10.0
Contractors Air Tools	190.6	181.6	181.6	+4.9
Mixers, Pavers, Spreaders	159.9	159.8	155.8	+0.1
Mixer, portable, 11 cf	168.2	166.8	164.1	+0.8
Mixer, portable, 16 cf	172.9	172.7	168.6	+0.1
Mixer, truck, 6 cy	131.1	135.1	131.1	−3.0
Mixer, Paving, 34 cf	192.9	196.7	191.6	−1.9
Concrete finisher, & spdr	198.4	201.9	191.5	−1.7
Bituminous distributor	124.5	126.2	122.3	−1.4
Bituminous spreader	179.4	170.2	170.2	+5.4
Bituminous paver	165.9	165.6	162.6	+0.2
Off-Highway Vehicles (b)	102.5	101.1	101.1	+1.4
truck (b)	102.0	101.1	101.1	+0.9
Trailer dump wagon (b)	106.7	101.4	101.4	+5.2

(a) January 1955=100 (b) January 1958=100

MANPOWER: Wages Will Rise Again

Common labor wages rose an average of 7.1 cents an hour (2.5%) in the second quarter, pushing ENR's 20-cities common labor average to a record $2.836 an hour. The ENR average of hourly rates for the three "key" skilled trades, bricklayers, carpenters and structural ironworkers moved up 1.9% (7.7 cents an hour) to $4.197.

Between now and December 1, deferred wage increases under long-term labor contracts, as well as increases granted under new contracts, should push common labor rates up an average of 4.3 cents an hour (1.5%) to $2.879. The skilled trades' wage average should rise 4.2 cents (1.1%) to $4.245 by December.

What's Ahead for Wages in the Second Half

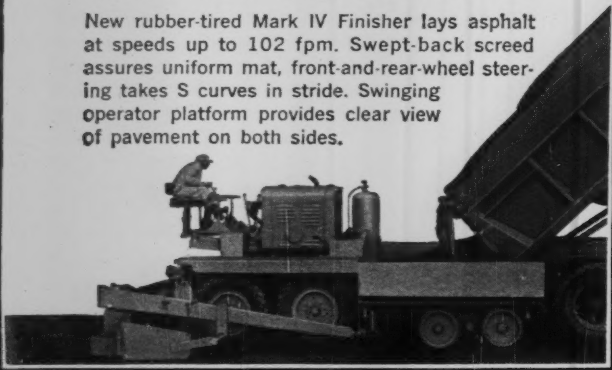
These deferred wage increases under long-term contracts will take effect between now and December 1. Wage hikes will be negotiated for other unions whose present contracts expire (Ex.) on dates shown.

	Common Labor		Skilled Labor			Equipment Operators		
	Building	Heavy Construction	Bricklayers	Carpenters	Structural Ironworkers	Tractor	Power Shovel	Air Compressor
Atlanta	Ex: 6/30	Ex: 6/30	Ex: 6/30	Ex: 6/30	Ex: 7/31	Ex: 6/30	Ex: 6/30	Ex: 6/30
Baltimore								
Birmingham	Ex: 8/31	Ex: 8/31	Ex: 9/1	Ex: 9/1	Ex: 7/1	Ex: 9/1	Ex: 9/1	Ex: 9/1
Boston					7/1:10.0¢			
Dallas				7/27:5.0¢				
Denver	9/1:5.0¢				10/1:10.0¢			
Los Angeles					8/16:32.5¢			
New Orleans	11/1:0.25¢	7/1:0.5¢	11/1:0.5¢	11/1:0.5¢	11/1:0.5¢	11/1:0.5¢	11/1:0.5¢	11/1:0.5¢
New York	7/1:10.8¢	7/1:10.8¢		7/1:10.8¢	7/1:11.2¢	7/1:10.8¢	7/1:10.8¢	7/1:10.8¢
Philadelphia		8/1:5.0¢			7/1:15.0¢			
St. Louis	11/1:10.0¢	11/1:10.0¢		11/1:10.0¢	11/1:10.0¢			
San Francisco					8/16:22.5¢	7/1:22.0¢	7/1:23.0¢	7/1:19.0¢
Seattle	Ex: 12/31	Ex: 12/31	Ex: 6/30	Ex: 12/31				

NOW-FROM

ASPHALT FINISHER

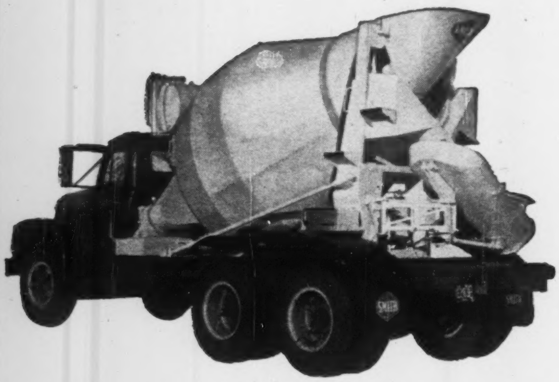
New rubber-tired Mark IV Finisher lays asphalt at speeds up to 102 fpm. Swept-back screed assures uniform mat, front-and-rear-wheel steering takes S curves in stride. Swinging operator platform provides clear view of pavement on both sides.



READY MIXED PLANTS

Complete plants including Smith-Gregco bins, batchers, conveyors, and silos are engineered for high production and complete electronic control throughout. For remodelling, the personalized engineering offered by Smith-Gregco guarantees you the right choice for new controls, larger batchers, or additional storage capacity.

TRUCK MIXERS



Only Smith offers you the choice of gear or chain drive, with exclusive torsion bar frame construction. Design allows higher maximum legal payloads, yet is far stronger than ordinary types. Specially engineered aluminum-and-steel truck mixers are now available for even greater payloads within legal weight limits. Smith truck mixers, with a complete range of sizes and models, are engineered for all trucks, not just one.

TURBINE MIXERS

Can bring high-speed mixing to existing plants with no costly extras or alterations. Low headroom requirements plus high capacity permit substantial savings in new-plant costs. Turbine produces concrete of any desired slump. Can be equipped with up to 4 air-operated discharge doors for delivery to trucks, block machines, pipe machines, or pre-stress equipment. From $1/3$ to 3 cu. yds. capacity.

CIRCLE 110 ON READER SERVICE CARD

T. L. SMITH

PORTABLE BATCHING PLANTS

GREGCO
GREGCO

Engineered by Smith-Gregco for fast portability, easy set-up and high production, with complete controls for manual, semi- or fully automatic operation. Available with 30 to 45 ton bins, 350 bbl. cement silos, 3 yard or 6 yard batchers.

TILTER MIXERS

Heavy-duty design. Proved in performance on world's largest construction jobs, and in central ready-mix plants. Capacities 2, 3, 3½, 4, 6, 7½, 10 cu. yds.

Remember, you can do the job better and more profitably with a Smith — whether you need an asphalt finisher, complete ready-mix concrete plant, batching plant, bins, or truck mixers.

Contact your nearby T. L. Smith distributor for more information. Tell him what you need and he will supply the unit that meets your requirements exactly. Or write direct.

SMITH

THE T. L. SMITH COMPANY
MILWAUKEE, WISCONSIN / LUFKIN, TEXAS
Affiliated with Essick Manufacturing Co., Los Angeles, Calif.

BUILDING NEED TUCKPOINTING?

Consult WESTERN WATERPROOFING CO., INC.

for BUILDING CLEANING • TUCKPOINTING • SUB-SURFACE WATER PROTECTION • CONCRETE RESTORATION

Remember, building repairs can be deductible expenses. All work done under contract; fully insured and guaranteed. No material for sale. Write for consultation service.

Nation's leading waterproofing contractors and engineers.

WESTERN WATERPROOFING CO., INC.
A Missouri Corporation And its Affiliate
RESTORATION COMPANY, INC.
1223 Syndicate Trust Bldg. • St. Louis 1, Missouri
NATIONWIDE SERVICE

CIRCLE 7 ON READER SERVICE CARD

37 H.P.... 25 H.P.... 18 H.P. CHAMPION CONCRETE SAWS

Self propelled or manually propelled models. Dual front pointer. Double end spindle and dual blade guard for right or left side cutting.

TUNGSTEN CARBIDE BONDED DIAMOND BLADES

A patented precision tool for sawing tile, block, ceramics and all other masonry materials. Out-perform other diamond blades from 10 to 50% in every instance.

DIAMOND AND ABRASIVE BLADES FOR CONCRETE CUTTING

Champion offers both patented tungsten carbide bonded diamond blades and "Super Sintered" Con-Flex abrasive blades in a wide range of specifications to meet every application.

Champion MFG. CO.
3700 Forest Park Ave.,
St. Louis 8, Missouri
JEfferson 1-6688

Masonry Saws and Blades • Concrete Saws and Blades • Portable Hoists • Portable Generators • Concrete Vibrators • Concrete Trowelers • Portable Space Heaters

NOTICE!

Dealerships available in some areas. Write or phone for information.

Costs Roundup—2nd Quarter

Where the Building Dollar Goes

Unit and Ratio Costs supplied through the courtesy of Haggerty-Messmer Co., Bozeman, Mont.; Coleman & Wood, Inc., Silver Spring, Md.; Wahl Construction Co., Saint Cloud, Minn.

TYPE OF: Building	Laboratory-Classroom		Home for Aged		College Dormitory c	
Construction: frame outside walls	steel & concrete brick-stone		concrete brick		concrete, cantilever slab brick-tile backup	
Date construction started	Sept. 1960		......		June 1959	
Location	Bozeman, Mont.		Washington, D. C.		Saint Cloud, Minn.	
SIZE OF BLDG:						
Height, stories	3		2½		6 & 4, both w/basement	
Floor area, sq ft	69,200		22,008		81,370	
Volume, cu ft	......		192,754		665,386	
RANGE of Cost of this type Bldg:						
$ per sq ft	$18.93		$13.65		$16.30	
$ per cu ft	......		1.56		1.99	
% Air Conditioned	......		......		......	
Engineering News-Record Building Cost Index (1913=100) 20-cities average	562		......		548	
PRINCIPAL ITEMS OF COST	$ and % of Total Cost					
	$	%	$	%	$	%
Excavation & site improvements	10,000	0.80	18,500	6.10	29,822	2.25
Foundations	22,100	1.70	6,200	2.04	incl in str frame	
Structural frame	380,200	29.00	....	.....	239,575	18.07
Cement finish work	4,500	0.40	31,300	10.30	9,604	0.72
Exterior masonry	192,000	15.00	49,300	16.22	88,405	6.66
Metal wall panels	....	.....	....	.....	4,203	0.32
Interior partitions	incl in masonry		....	.....	67,595	5.10
Carpentry & millwork	29,000	2.20	24,000	7.90	158,871	12.08
Sash & glazing	....	.....	1,400	0.46	94,073	7.09
aluminum	43,885	3.50	....	.....	....	.....
Doors	8,000	0.60	....	.....	6,507 d	0.49
Roofing	18,250	1.40	12,000	3.95	13,030	0.98
Insulation	incl in roofing		1,000	0.33	4,125 e	0.32
Waterproofing & dampproofing	incl in roofing		....	.....	1,650	0.15
Metal lath, furring, & plastering	3,800	0.30	11,900	3.90	72,787	5.49
Hollow metal work	19,500	1.50	4,400	1.45	7,975	0.60
Misc iron & ornamental metal	24,200	1.90	5,800	1.91	5,852	0.45
Tile, terrazzo, & marble	27,300	2.10	2,800	0.92	20,460	1.46
Floor covering	6,500	0.50	5,300	1.74	25,974	1.91
Painting	17,850	1.40	8,800	2.90	33,217	2.54
Finish hardware	incl in hollow metal		5,900	1.94	34,104	2.58
Acoustical ceilings	23,000	1.80	8,000	2.63	incl in plastering	
Plumbing	279,000	21.00	incl in heating, etc.		181,900	13.72
Heating, ventilating, & air conditioning	incl in plumbing		72,400	23.80	incl in plumbing	
Electrical work & light fixtures	90,450	7.00	19,000	6.25	107,357	8.01
Elevators	25,300	1.90	16,000	5.26	46,563	3.51
Production equipment	....	.....	....	.....	56,232 f	4.24
Miscellaneous	85,000 a	6.00	....	.....	....	.....
Corkboards	....	.....	....	.....	8,132	0.61
Bond & Insurance	....	.....	....	.....	8,610	0.65
Total Cost	$1,309,835	100%	$304,000 b	100%	$1,326,623 g	100%

a sun screens, chalk & tackboards, glass & glaze, alum shutters, cold rooms, seats, toilet partitions b $/unit of capacity = $10,450 per bedroom c 400 beds & eating facilities for 560 d alum entrances e caulking & weatherstrip f kitchen & food service g $/unit of capacity = $3,316 per bed

This report is the twentieth in Engineering News-Record's Building Dollar series. Earlier reports were in ENR Oct., 1953; Sept. 29, 1955; July 5, 1956; Aug. 2, 1956; Dec. 6, 1956; Oct. 17, 1957; Mar. 20, 1958; Dec. 25, 1958; Mar. 19, 1959; June 18, 1959; Dec. 17, 1959; Mar. 24, 1960; June 23, 1960; Dec. 22, 1960; Mar. 23, 1961.

The contrasting effects of a building's purpose on its cost shows up in these structures. The home for the aged in Washington, D. C. costs $13.65 a square foot, the college dormitories in St. Cloud, Minn., $16.30 and the laboratory-classroom in Bozeman, Mont., $18.93. All three use brick construction, the dormitories have a concrete frame, cantilever slab and tile backup for the brick, the lab-classroom is steel-concrete with brick and stone walls.

It is in the mechanicals where the main differences show up: Electrical work accounts for 6.25% of the cost in the home for the aged, 7% in the laboratory-classroom and 8.01% in the dormitories. Elevators take 5.26% in the home for the aged, 3.51% in the dormitories, 1.9% in the laboratory-classroom. Plumbing and heating account for 23.8% of the cost of the home for the aged, 21% of the lab-classroom and 13.72% of the dormitories.

ASBESTOS-CEMENT SEWER-PIPE BY KEASBEY & MATTISON

P. H. Van Orden, President, C. L. Peterson, Vice-President and Treasurer, and R. H. Webb, Foreman of the Van Orden Company, Contractors, of Grand Rapids, Mich., supervise the installation of "K&M"® Asbestos-Cement Sewer Pipe at Paw Paw, Mich.

10,000 FT. OF SEWER PIPE LAID...

... not enough infiltration to measure

Read how the Van Orden Company solved the problems of installation and of infiltration when pipe had to be laid 9 ft. below the water table. →

P. H. Van Orden

“the ease of handling and assembly saved us dollars and time!”

"Construction of the Paw Paw trunk sanitary sewer called for installation of pipe at depths up to 19 feet, where water table was at 10 feet. Infiltration had been the major problem in other sewer installations in the area. We solved this problem by using "K&M" Asbestos-Cement Sewer Pipe with its FLUID-TITE joint. With 10,000 feet of sewer in, we haven't had enough infiltration to measure.

"The longer laying lengths and the speed with which a joint can be made are definite time-saving factors, which have added to our production. Less time spent grading pipe and handling material means dollars saved."

Rigorous tests prove "K&M" Asbestos-Cement Sewer Pipe is infiltration-tight at 25 psi . . . a pressure equivalent to that of a 58-foot head of water.

"K&M" Asbestos-Cement Sewer Pipe wont rust, rot, or corrode. Its smooth bore remains clean, permanently. Flatter grades are possible. Fewer lift stations are required.

Maintenance-wise, the village of Paw Paw, Mich., will enjoy tax savings. "K&M" Asbestos-Cement Sewer Pipe is practically indestructible. Requires fewer inspections, because root growths do not penetrate the exclusive FLUID-TITE coupling.

Write today for more information on "K&M" Asbestos-Cement Sewer Pipe to: Keasbey & Mattison Company, Ambler, Pa.

Keasbey & Mattison at Ambler

K·M
BEST IN ASBESTOS

Two-step assembly! Lubricate the tapered end of "K&M" Asbestos-Cement Sewer Pipe, then slide it into the exclusive, patented "K&M" FLUID-TITE® Coupling.

Light weight reduces shipping and handling costs...saves on installation time. At the same time, there's a minimum of wastage and breakage on the job, with tough "K&M" Asbestos Sewer Pipe.

Costs Roundup—2nd Quarter

Where the Garage Building Dollar Goes

Cost and capacity of off-street parking facilities

Information supplied through the courtesy of E. Turgeon Construction Co., Inc., Providence, R. I.; William L. Crow Construction Co., New York, N. Y.; Rock City Construction Co., Nashville, Tenn.; The Lathrop Co., Toledo, Ohio

LOCATION	**Providence, R. I.**	**New York, N. Y.**	**Nashville, Tenn.**
COST:			
$/sq ft	$7.18	$10.50	$5.00
$/cu ft	0.708	1.15	0.54
$/stall	....	4,100	1,785
Total	$250,000	......	$892,000 b
Type of Structure	four-level	steel a	reinforced concrete
ELEVATORS:			
passenger, no	....	......	1
vehicular, no	....	2, in travelling towers	....
type	....	automatic	....
Type of Construction	reinforced concrete	steel & open curtain wall	hydraulic
SIZE: Levels,			
above ground	26,100 sq ft	8	....
below grade	8,700 sq ft	½ for equipment	313 ft x 165 ft
total parking	....	8	....
Area, floor sq ft	....	13,000	160,000
Space, enclosed cu ft	....	130,000	1,700,000
Capacity, stalls, cars	....	270	500
Cars per hour	....	60	....
AREA of land occupied sq ft	8,900	13,000	51,000
ANGLE of stalls	right angle	parallel to driveway	45 degrees

a not fireproofed b incl 50,000 sq ft crab-orchard stone plaza w/planters & pool. This footage not incl in figures but cost is. Part of excavation ($90,000) was done under separate contract, cost not incl

LOCATION	**Michigan c**	**Toledo, Ohio d**	**Toledo, Ohio e**
COST:			
$/sq ft	$4.87	$3.43	$4.46
$/cu ft	0.63	.....	.....
$/stall	1,800	1,140	1,200 design—1,000 capacity
Total	$795,000	$305,000	$603,000
Type of Structure	ramps	continuous ramp floor w/express ramp exit	ramp
ELEVATORS:			
passenger, no	1 now—1 future	1	1
vehicular, no	.....	.....	.....
type	.....	.....	.....
Type of Construction	flat slab, concrete	structural steel f	ribbed slab
SIZE: Levels,			
above ground	177 degrees × 123 degrees	120 ft × 185 ft	45,000 sq ft floor
below grade	177 degrees × 123 degrees	60 ft × 185 ft	.....
total parking	.....	.....	.....
Area, floor sq ft	163,000	88,000	135,000
Space, enclosed cu ft	1,253,000	.....	.....
Capacity, stalls, cars	441	268 g	502 design—602 capacity
Cars per hour	.....	.....	.....
AREA of land occupied sq ft	23,500	24,000	48,000 h
ANGLE of stalls	90 degrees	60 degrees	90 degrees

c 1961, lower Michigan d 1955 e 1953 f not fireproofed g self park h approximate

Square foot costs for the six buildings listed above range all the way from a low of $3.43 for Toledo, Ohio's conventional ramp garage to $10.50 for New York City's electronically automated structure, where two vehicular elevators in travelling towers lift cars into stalls as high as eight stories.

Similiarly, cubic foot prices range from $0.63 for a Michigan ramp garage to a high of $1.15 for the push-button New York structure. The average cubic foot cost for the three non-automated structures reporting is $0.65.

Costs per stall had a spread of from $1,000 for an Ohio ramp structure operating at capacity to $4,100 for the New York garage, where cars are automatically lifted into stalls parallel to the driveway. The average per stall is $1,431 for non-automated.

The capacity of the automatic garage is only 270 cars, as compared with the largest ramp structure with 620 stalls. However, the automated garage parks and departs cars at the rate of one-a-minute, a considerable time advantage over the ramps.

How come Joe can bid so low on those concrete jobs he's getting?

Uses UNI-FORM Panels. Says they're the fastest, cheapest method of forming concrete he's ever used.

Think he's right?

Don't know . . . I've sent for their new catalog to see what they're all about. Why don't you use the coupon down below and get your copy.

Thanks — I think I will.

Send me a copy of the new Universal Catalog 761.

NAME__________
TITLE__________
COMPANY__________
ADDRESS__________
CITY______ZONE___STATE______

UNIVERSAL FORM CLAMP CO.
1238 N. Kostner Avenue, Chicago 51, Illinois

CIRCLE 115 ON READER SERVICE CARD

Helping to keep a river clean...

HAMILTON KENT

TYLOX

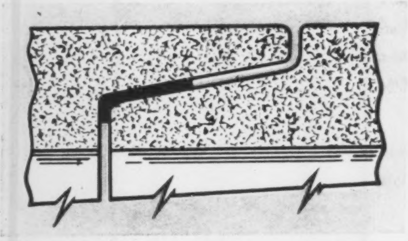
Rubber

PIPE GASKETS

*PREVENT JOINT LEAKS, WHIP CORROSION AND SPEED PIPE WORK ON SEWER PROJECT AT OIL CITY, PA.**

Oil Creek, a watercourse in Oil City, Pa., will be cleaner, purer, and an even greater enhancement to the beauty of the city, as a result of current work being done under Oil City's continuing sewer expansion program. Consisting of several miles of new laterals, new concrete pipe interceptors up to 36″ in diameter, and a new sewage treatment plant, the facilities now being added make it possible to treat all sewage waste disposal before effluent is discharged into the river.

Engineers and officials specified Hamilton Kent TYLOX Rubber Gaskets for coupling the pipe lines, knowing they could count on TYLOX for three important advantages: leak-proof joints to keep infiltration loads negligible at the new plant; acid-resistance to prevent deterioration of the joints and necessity of future repairs; and easier, faster pipe coupling, to help keep construction costs down.



TYLOX Gaskets form a permanently tight **compression** seal. Water can't leak in or out . . . roots and sediment can't penetrate . . . acids can't destroy. Pipe can be coupled in wet trenches . . . backfill may be applied immediately.

5099

WRITE FOR ENGINEERING DETAILS ON TYLOX—
Specify TYLOX FOR YOUR PIPE PROJECTS

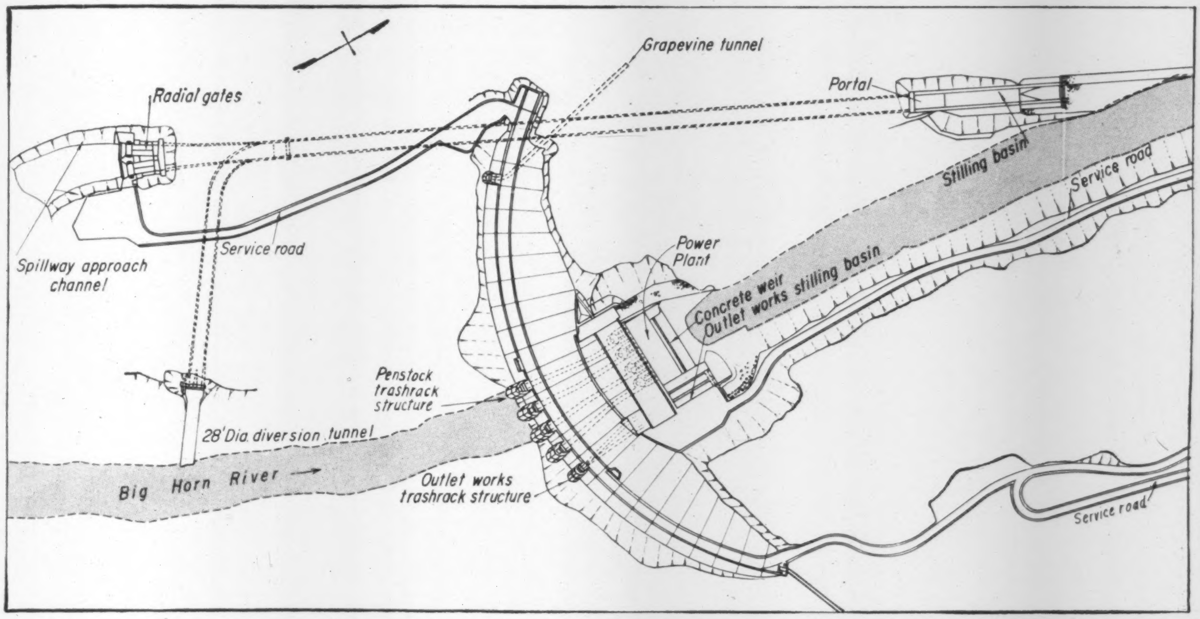
* **PROJECT:** Sanitary sewer expansion, Oil City, Pa.

ENGINEERS: Morris Knowles, Inc., Consultants, Pittsburgh, Pa., R. B. Fleming, Resident Engineer.

CONTRACTOR: Ben Construction Co., Pittsburgh, Pa.

PIPE: Reinforced concrete, manufactured by Concrete Pipe Co. of Ohio, Cleveland, Ohio.

HAMILTON KENT
MANUFACTURING COMPANY
KENT, OHIO
427 West Grant Street Orchard 3-9555


Grapevine tunnel
Radial gates
Portal
Stilling basin
Service road
Spillway approach channel
Service road
Power Plant
Concrete weir
Outlet works stilling basin
Penstock trashrack structure
28' Dia. diversion tunnel
Big Horn River
Outlet works trashrack structure
Service road

YELLOWTAIL DAM'S concrete arch rises 500 ft above the streambed and has a crest length of 1,450 ft. Penstocks go through dam to powerplant along its toe. Reservoir runs 47 miles through Bighorn Canyon, inundates 71 miles of river at maximum capacity.

Yellowtail Power Bidding Lively

Only $27,000 separated the $39.8 million low bids for Yellowtail dam and power plant on the Bighorn River in Montana. The Morrison-Knudsen joint venture at $39,809,359 took the award by the Bureau of Reclamation. This is 13% under the engineer's estimate. The high of seven bids was $50.2 million which topped the contract price by 26% and engineer's estimate by 10%.

Yellowtail is a concrete arch dam, the fifth highest at 520 ft, 500 above the streambed. Its maximum base width is 180 ft. Its crest is 25 ft wide, and 1,450 ft long. The site is 45 miles southwest of Hardin and 43 air miles southeast of Billings. A 5-mile access road will have to be built to connect with the county road into Hardin.

The power plant will span the canyon along the toe of the dam. It will have four generating units with 50,000 kilowatts capacity each and four hydraulic turbines, each supplied by a penstock through the dam.

The government will supply metal stairways, gantry cranes, storage tanks, hoists and controls for fixed-wheel gates, radial gates, hollow jet valves, and stoplogs for the dam and power plant; all other material will be provided by the contractor.

The reinforced concrete spillway, in the left abutment (see above), will be divided into two bays, each controlled by a radial gate 25 ft long and 64.5 ft high. It will discharge into a 1,890 ft long 32-ft dia tunnel.

Yellowtail reservoir runs for 47 miles through Bighorn Canyon. It will impound 1,375,000 acre-feet and, at its maximum capacity, inundate 71 miles of the river. The reservoir moves out of the canyon about 4.5 miles south of the Montana-Wyoming boundary, and increases its maximum width to 2 miles. In addition to its major purpose, irrigation, hydroelectric power, and flood control, it will improve fish and wildlife resources and provide for recreational development.

Wage rates include: asbestos workers, $3.92/hr; boilermakers, $3.85; carpenters, $3.30; cement masons, $3.35; structural ironworkers, $3.75; plumbers, $3.65; laborers, $2.54/hr.

The bidding included:

1C	Morrison-Knudsen Co., Inc.; The Kaiser Co.; Perini Corp.; Walsh Const. Co.; F & S Contr. Co., Boise, Id	$39,809,359
2	Al Johnson Const. Co.; Winston Bros. Co.; Johnson, Drake and Piper, Inc.; Foley Bros., Inc., Minneapolis, Minn	39,836,166
7	The Arundel Corp.; L. E. Dixon Co.; American Pipe and Const. Co.; The Hunkin-Conkey Const. Co., San Gabriel, Calif	50,201,240
EE	J. R. Granger, Hardin, Mont	45,752,418

Bids: 4-11-61 Items	Unit	Quantity	Unit Prices	
			1 C	2
Schedule A, dam and power plant				
Diversion & care of river during const & unwatering fdn	ls	job	$80,490	$500,000
Stripping canyon walls	cy	20,000	11.50	16.00
Exc, open cut for dam & powerplant, common	cy	355,000	1.35	1.20
rock, first 250,000 cy	cy	250,000	4.00	8.32
over 250,000 cy	cy	243,000	3.40	2.15
open cut for diversion & spillway tunnel				
common	cy	230,000	1.45	1.35
rock	cy	240,000	2.70	2.18
rock, drill line holes	lf	77,000	0.95	1.50
all cl, trans ckt clr	cy	9,000	5.30	3.50
rock, for switchyard	cy	33,000	3.40	2.30
common, for switchyard	cy	15,000	0.95	0.70
all cl, open cut in faults & seams	cy	1,000	25.00	12.00
in shafts, for cut-offs	cy	500	95.00	57.00
in tunnels, for cut-offs	cy	5,000	33.00	43.00
in diversion tunnel	cy	77,000	18.00	23.00
in spillway tunnel	cy	35,000	35.00	18.00
in Grapevine tunnel	cy	1,500	26.00	38.00
in grouting & inspection tunnels	cy	11,200	33.00	44.00
Steel, str, tunnel supports diversion & spillway	lb	411,000	0.34	0.27
other than diversion & spillway	lb	520,000	0.45	0.31
Bolts, tunnel roof supt.	lf	5,000	6.60	4.60
Chain link fabric, tunnel roof supt	sy	830	4.80	5.20
Backfill, compacted	cy	10,000	1.45	2.10
Riprap	cy	4,600	4.80	8.00
Gvl blanket, graded, for riprap	cy	1,425	4.80	5.00
Compacting, switchyard embankments	cy	40,000	0.95	0.35
Core drilling, BX holes in stage,				
0'–50' depth	lf	1,000	4.00	3.16
50'–100' depth	lf	1,000	4.00	3.17
100'–150' depth	lf	1,000	4.00	3.18
150'–200' depth	lf	1,000	4.00	3.20
200'–250' depth	lf	1,000	4.00	3.20
250'–300' depth	lf	100	5.00	4.22
NX holes in stage,				
0'–50' depth	lf	500	4.75	3.75

(Continued on page 121)

Make more profit on the jobs ahead with . . .

SYMONS® CONE CRUSHERS

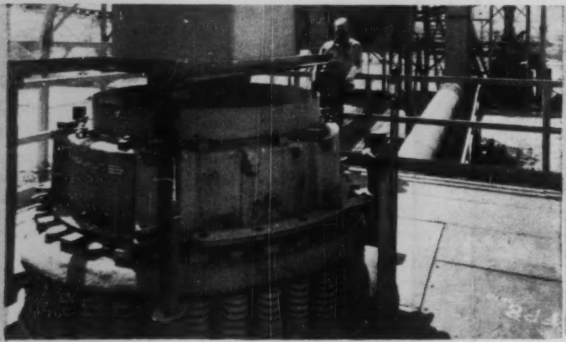
FOR VOLUME PRODUCTION OF QUALITY AGGREGATE

These dramatic views of sections of the important new Illinois Tollway system serve as an outstanding example of the vast contributions to the progress of mankind being made by the construction industry. In huge construction projects such as this, specification aggregate has assumed an increasingly important role. To meet the constantly growing demand for vast tonnages of quality aggregate used in concrete and bituminous highways, Symons Cone Crushers are today, more so than ever before, the first choice of leading producers throughout the world. Symons Cone Crushers are also used in sand preparation operations.

For in aggregate and sand production . . . *as in all of the great ore and industrial minerals operations the world over* . . . no record equals the performance of Symons Cone Crushers that have so consistently produced, economically and efficiently, great quantities of finely crushed product resulting in higher profit per ton per hour.

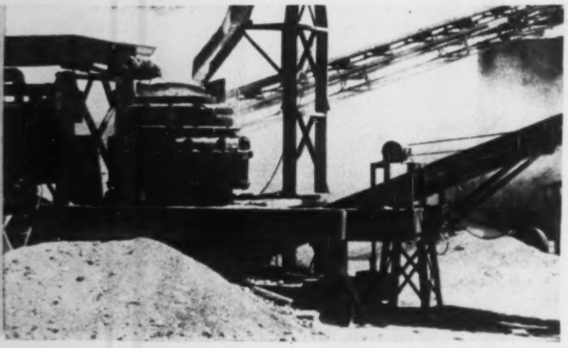
Before you submit *your* next bid, get full information about Symons Crushers.

SYMONS . . . a registered Nordberg trademark known throughout the world



FOR STATIONARY PLANTS

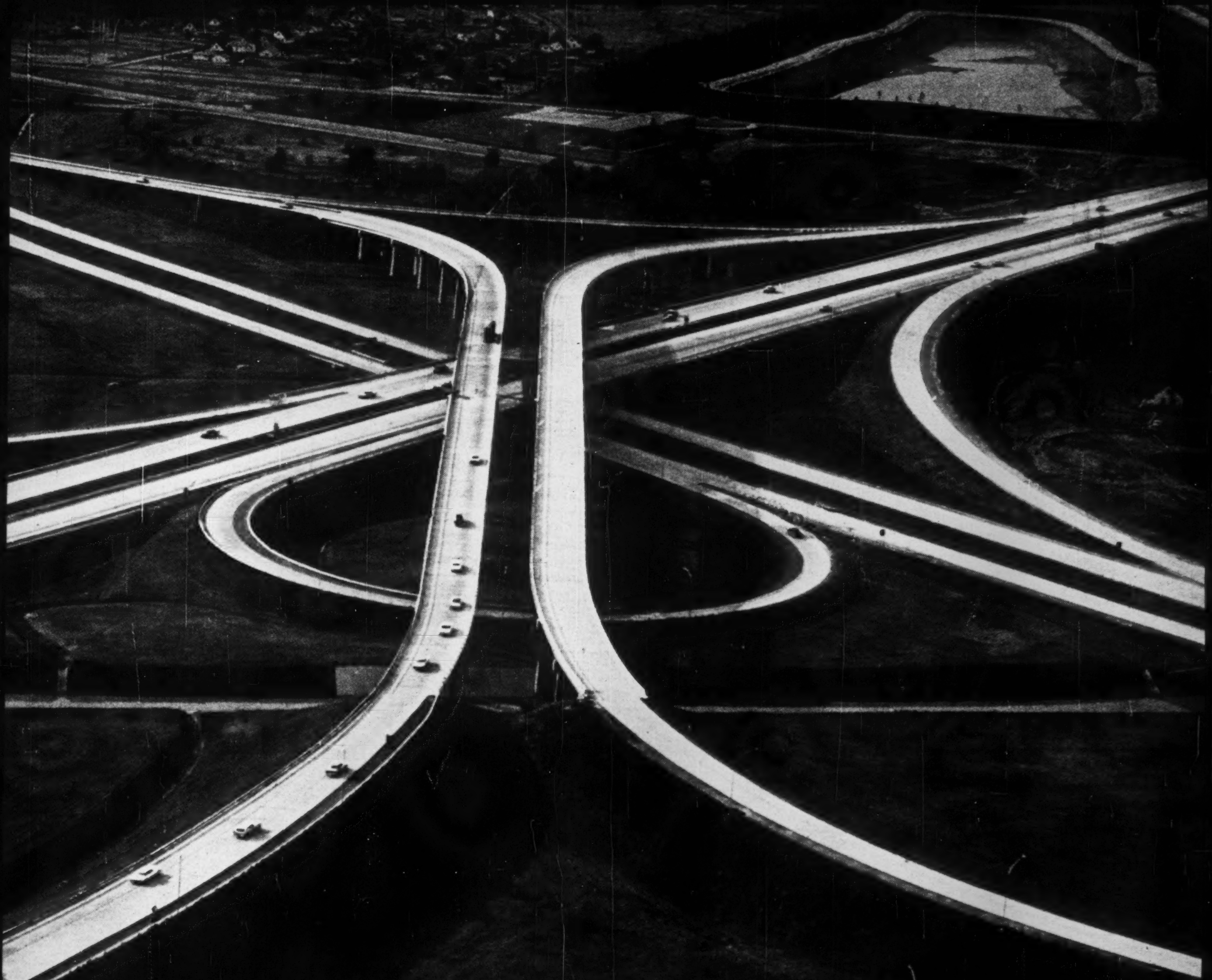
Symons Cone Crushers, in Standard and Short Head types, are the choice of leading contractors and producers for primary, secondary and finer reductions in all types of aggregate operations. Available in sizes from 22″ to 7′ in diameter, for capacities from 6 to 900 or more tons per hour.



FOR PORTABLE PLANTS

Symons Cone Crushers are being used in increasing numbers for portable and semi-portable crushing plants. View shows part of a Cedarapids portable crushing and screening plant, utilizing a Symons Cone Crusher. Unit is serving a large Texas aggregate producer.

CIRCLE 118 ON READER SERVICE CARD

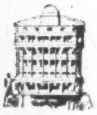


C-160

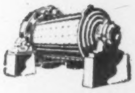
ILLINOIS TOLLWAY

(ABOVE:) Tri-level interchange of Northwest and Tri-State Tollways near Chicago's O'Hare International Airport.

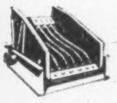
(RIGHT:) View of the modern Northwest Tollway bridge crossing the Fox River near Elgin, Illinois.



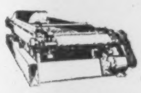
SYMONS PRIMARY GYRATORY CRUSHERS



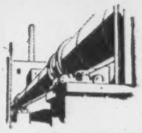
NORDBERG GRINDING MILLS



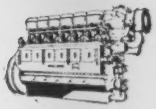
SYMONS VIBRATING GRIZZLIES



SYMONS VIBRATING SCREENS



ROTARY KILNS AND DRYERS

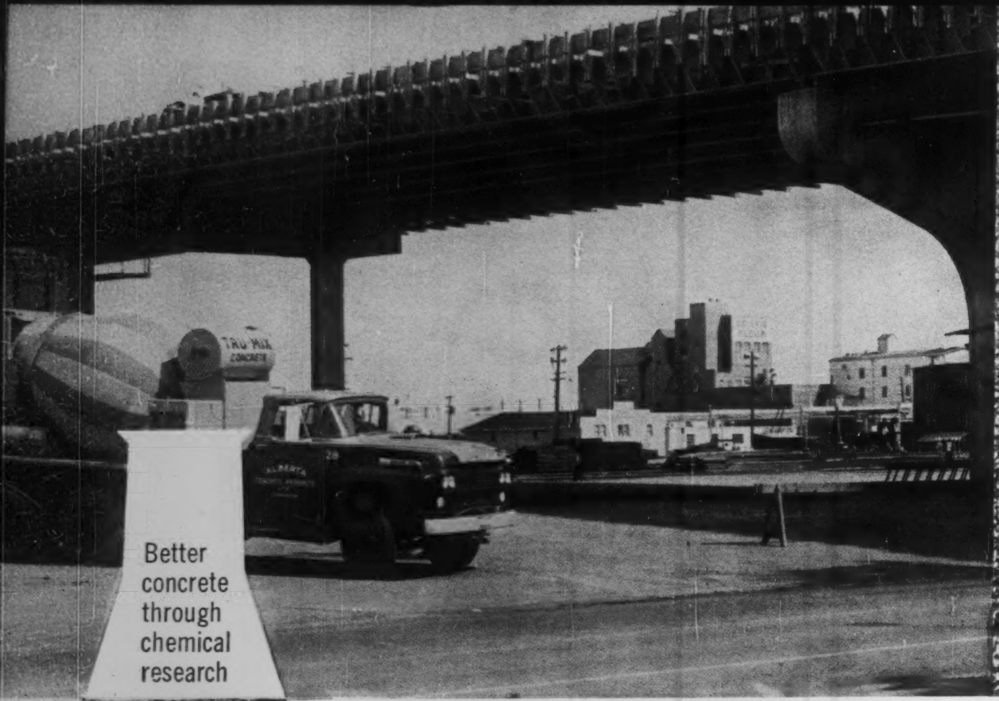


NORDBERG ENGINES

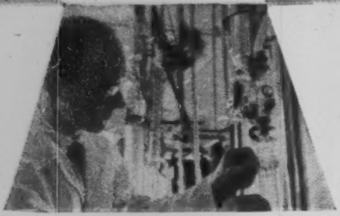
NORDBERG MANUFACTURING COMPANY • Milwaukee 1, Wisconsin

ATLANTA • CLEVELAND • DALLAS • DULUTH • HOUSTON • KANSAS CITY • MINNEAPOLIS • NEW ORLEANS • NEW YORK • ST. LOUIS
SAN FRANCISCO • TAMPA • WASHINGTON • TORONTO • VANCOUVER • JOHANNESBURG • LONDON • MEXICO, D.F.

© 1960, N.M.CO.



Better concrete through chemical research



DEWEY AND ALMY

daratard

INITIAL SET RETARDER

On the job at EDMONTON, CANADA, OVERPASS

Concrete deck slabs for spans up to 95 feet long and 45 feet wide were completed in one pour. To prevent cracking due to deflection of the steel beams as the load was continuously applied, the set of concrete was delayed by the use of DARATARD—Dewey and Almy's initial set retarder. Although temperatures ranged from 65° to 95°F., uniform quality of the concrete was easily controlled by adjusting the addition rate of the ready-to-use liquid retarder.

A liquid air entrainer, DAREX AEA, was used in all exposed concrete to give maximum durability. WRDA, water reducing admixture, was specified in foundations, piers, and retaining walls where retardation was not required.

OWNER: CITY OF EDMONTON. GENERAL CONTRACTOR: BENNETT & FORSTER LTD. DESIGN ENGINEERS: C. C. PARKER WHITTAKER AND CO. LTD. READY MIX SUPPLIER: ALBERTA CONCRETE PRODUCTS LTD. ADMIXTURE SALES & TECHNICAL SERVICE: CON SPEC SALES, LTD.

DEWEY AND ALMY

CHEMICAL ADMIXTURES FOR CONCRETE CONTROL

Research Perfected — Proved in Use

DAREX AEA

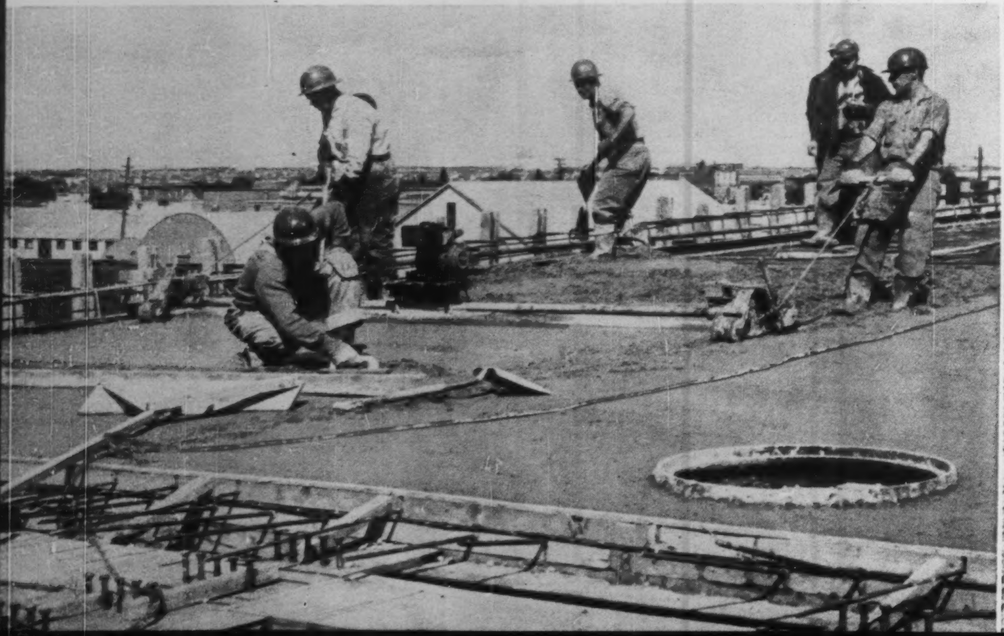
provides controlled air entrainment and greater durability

WRDA

controls water content

DARATARD

controls retardation of initial set



W. R. GRACE & CO.

GRACE

DEWEY AND ALMY
CHEMICAL DIVISION
Cambridge 40, Mass.
Chicago 38, Illinois
San Leandro, Calif.
Montreal 32, Canada

Catalog 9/DE
Sweet's Architectural File

. . . Yellowtail Dam

Bids: 4-11-61 Items	Unit	Quantity	Unit Prices 1C	Unit Prices 2
Core drilling, NX holes in stage,				
50′-100′ depth	lf	500	4.75	3.75
100′-200′ depth	lf	1,000	5.50	4.25
5½φ holes, to 50′ depth	lf	200	8.50	7.00
Casing, BX core holes in stage,				
0′-30′ depth	lf	330	5.00	3.80
30′-60′ depth	lf	50	5.00	3.88
EX grout holes in stage,				
0′-30′ depth	lf	1,550	4.00	2.74
30′-60′ depth	lf	150	4.50	3.16
Drilling grout holes in stage,				
0′-30′ depth	lf	51,000	1.95	1.59
30′-60′ depth	lf	18,000	1.95	1.59
60′-110′ depth	lf	22,500	1.95	1.60
110′-160′ depth	lf	14,400	1.95	1.59
160′-210′ depth	lf	9,200	2.10	1.81
210′-260′ depth	lf	1,400	2.50	2.11
260′-310′ depth	lf	200	3.10	2.68
Pipe, met, & ftg, for fdn grouting & drainage	lb	94,000	0.60	0.48
Hook-ups, to fdn grout holes	ea	1,840	13.00	10.25
Pressure grouting, cmt & bulking mat,				
str fdn, 1st 75,000 sacks	ea	75,000	1.50	1.28
over 75,000 sacks	ea	72,000	1.00	0.87
from grouting & inspection tunnels,				
1st 160,000 sacks	ea	160,000	1.50	1.45
Over 160,000 sacks	ea	146,000	0.75	0.67
Bulking mat for pressure grouting	cy	10,300	12.00	4.00
Tubing, met, & ftg, for grouting contraction jts	lb	196,000	0.90	0.60
Hook-ups, contraction jts, grouting sys	ea	355	50.00	41.00
Pressure grouting, contraction jts, & cool sys	sack	13,400	2.60	2.25
Drill drainage holes, other than spillway & diversion tunnels, in stage,				
0′-25′ depth	lf	4,725	3.60	3.16
25′-50′ depth	lf	4,550	3.60	3.16
50′-75′ depth	lf	4,200	3.60	3.20
75′-100′ depth	lf	3,100	3.80	3.42
100′-150′ depth	lf	1,000	3.80	3.44
150′-200′ depth	lf	500	4.50	4.20
in spillway & diversion tunnels	lf	5,000	3.80	3.52
Pipe, sew, perf, 8″φ, & const drains				
w/open jts	lf	720	4.00	3.55
8″φ w/closed jts	lf	160	4.00	2.75
Drains, split sew pipe, const w/cmted jts	lf	1,000	4.00	3.50
Drilling holes, anchor & grouting bars	lf	16,600	1.50	1.90
Cmt, except for grouting	bbl	1,050,000	4.60	4.94
sacked, for grouting fdn & cool sys	sack	180,000	1.95	1.65
special, for grouting contraction jts	sack	7,560	2.40	1.75
Pozzolan	t	72,000	19.50	17.65
Conc surf, special finish	sy	3,100	8.75	12.00
Reinf bars, #3	lb	4,000	0.17	0.20
#4 & #5	lb	532,000	0.17	0.17
#6 & #7	lb	1,775,000	0.15	0.15
#8 & larger	lb	5,166,000	0.15	0.14
Conc in dam,				
1st 840,000 cy	cy	840,000	9.50	9.80
over 840,000 cy	cy	835,000	8.50	6.45
in shafts for cut-offs	cy	500	7.80	11.00
backfill in tunnel cut-offs & exist fdn tunnels	cy	7,500	8.80	11.00
Conc, sidewalks & parapets	cy	820	95.00	95.00
trashrack & gate hoist str	cy	5,140	136.00	100.00
roadway cantilevers	cy	1,250	78.00	60.00
elevator tower	cy	480	130.00	150.00
blockouts	cy	780	130.00	210.00
diversion tunnel closure str	cy	1,200	39.00	52.00
floors of grouting & inspection tunnels	cy	1,460	48.00	42.00
backfill around steel liner in Grapevine Tunnel	cy	410	15.00	22.00
spillway intake str	cy	11,300	19.00	21.00
spillway stilling basin	cy	6,800	~~24.00~~	26.00
lining of diversion tunnel	cy	4,800	57.50	60.00
lining of spillway tunnel	cy	23,600	47.50	40.00
diversion tunnel plug & backfill conc	cy	4,600	11.00	18.00
river outlets stilling basin & left gravity wall	cy	6,100	24.00	25.00
tailrace weir & retaining wall for riprap	cy	450	39.00	60.00
misc str	cy	320	146.00	75.00
roadway & operating decks for spillway bris	cy	60	195.00	153.00
powerplant & outlet str substructures	cy	10,900	24.00	26.00
intermediate str	cy	6,600	68.00	60.00

Bids: 4-11-61 Items	Unit	Quantity	Unit Prices 1C	Unit Prices 2
Conc, superstructures	cy	460	170.00	125.00
cntrl cable envelope	cy	90	195.00	120.00
cooling	cy	1,679,600	0.30	0.54
beams, precast, prestr, const & erect 8	ls	job	9,500	7,512
Pipe or tubing, met, 1″ outside φ, & ftg for conc cool sys	lf	1,323,700	0.25	0.50
Drilling in conc, cores, 10″φ	lf	300	34.00	26.00
Seals, met, in dam	lf	48,350	3.20	3.70
tp N2	lf	3,000	3.30	2.95
Grout groove covers, met	lf	13,000	2.40	2.30
Jts, control, const tp A	lf	180	6.80	2.95
Jt filler, corkboard, 1″	sf	11,200	1.95	2.50
sponge rubber, 1″	sf	280	3.30	3.00
½″	sf	1,525	2.40	2.40
Waterstops, rubber, tp D	lf	520	3.20	3.90
tp E	lf	960	3.50	5.30
tp F	lf	2,800	2.60	3.40
Jt strips, rubber				
w/metal straps	lf	150	2.60	5.50
w/out metal straps	lf	580	1.60	4.50
Asphalt seals, const	lf	460	12.00	25.50
Floor hardener, conc, 2-ct	sy	2,300	1.00	1.25
Dampproofing, asphalt-emulsion, 2-ct	sy	90	2.00	1.70
Dampproofing compound, clear, 3-ct	sy	950	1.00	2.10
Waterproofing, membrane	sf	8,700	0.80	0.55
Insulation, roof	sf	16,800	0.65	0.48
Felt, asphalt saturated, built up roofing, 4-ply	sf	17,700	0.35	0.40
Brick walls, for powerplant & outlet strs	sf	26,800	5.80	1.65
Conc msry unit walls for powerplant str, 8″	sf	1,600	1.45	1.35
12″	sf	1,500	1.90	1.45
Steel, for powerplant & outlet str superstr	lb	1,600,000	0.25	0.23
Fillers, ins met panel	sf	900	3.90	3.50
Steel, roof decks	sf	17,000	0.75	0.70
Doors, met rolling	sf	1,200	8.00	6.40
steel swinging	sf	250	6.80	10.90
Windows, aluminum	sf	2,600	7.30	2.15
Louvers, stormproof				
operable	sf	3	48.00	30.00
automatic	sf	55	58.00	50.00
stationary	sf	10	39.00	16.50
CIP, soil, & ftgs, except for sanitary sys	lb	33,000	0.48	0.59
CI, bell traps	lb	750	0.70	0.82
bell-&-spigot, flanged pipe, wall pipes, & ftgs	lb	71,000	0.65	0.59
Pipe, steel, & ftgs				
2″ & smaller in nominal φ	lb	3,100	0.70	0.88
2½″ & larger in nominal φ, except for sanitary sys	lb	10,200	0.65	0.95
Vlvs, 2″ & smaller in nominal φ	lb	75	4.80	5.40
2½″ & larger in nominal φ, except draft-tube drain vlvs	lb	9,500	1.15	1.57
draft-tube drain	ea	4	1,150	905.00
Pipe, met, ftgs & vlvs				
under 6″ φ	lb	17,500	0.60	0.52
over 6″ φ	lb	198,400	0.29	0.48
CIP, soil & ftgs, CI bell-&-spigot water pipe & ftgs for sanitary sys	lb	20,000	0.65	0.65
GSP & ftgs, 4″ & smaller in nominal φ, for sanitary sys	lb	2,000	0.75	1.02
WIP, galv & ftgs, 6″ & smaller in nominal φ, for roof & trans deck drain sys	lb	12,000	1.15	1.43
Ab & anchorage	lb	3,000	0.95	1.80
install	lb	76,500	0.65	0.40
Stairway, in dam & elevator tower*	lb	125,000	0.35	0.35
Trashracks & slot closures*	lb	625,000	0.10	0.08
Handrails, pipe*	lb	4,500	0.35	0.60
Doors, safety, add 2, & frames*	ls	job	1,500	2,500
Track for 90-t gantry crane*	lb	99,000	0.10	0.22
Metalwork, embedded*	lb	14,000	0.20	0.50
nonembedded*	lb	75,000	0.30	0.32
Tanks, storage*	lb	38,600	0.10	0.13
Metalwork, misc	lb	158,000	0.65	0.60
for sew treatment plant*	lb	1,400	0.50	0.32
Gratgs, for draft-tube piers	ea	8	580.00	705.00
Heating sys, crane rail & roadway drain	ls	job	1,600	5,600
Air sys, ice prevention*	lb	19,000	1.25	1.50
Cable, elec heating, for drainage trenches	lf	1,000	3.40	2.00
Cranes, overhead travelling, two 125-t, one 30-t*	ls	job	19,500	41,000
Crane, gantry, 90-t*	ls	job	22,500	27,000
testing	ls	job	12,500	17,000
one draft-tube bhd gate gantry*	ls	job	4,800	1,550
Penstocks, outlet pipes, steel liner compl w/access	ls	job	780,000	826,146
Bellmouths, two 84″*	ls	......	2,400	2,700
Penstock fixed-wheel gate frames, four*	ls	job	44,000	19,500

(Continued on p. 123)

←CIRCLE 120 ON READER SERVICE CARD

CIRCLE 121 ON READER SERVICE CARD→

NORDBAK
Just mix and pour

NORDBAK

Tough, Resilient,

Non-Metallic

Here it is! NORDBAK . . . the manganese backing you pour at "room temperature." You simply mix the contents of two cans together and pour!

Field tests and on-the-job experience show that NORDBAK really works! Because it's resilient and non-shrinking, it provides excellent backing. It's so tough that in a prolonged test the manganese wore through in spots, but NORDBAK remained uncracked. It's easily removed at changeout, too. You can store NORDBAK at your operations . . . get a supply to keep on hand, ready for the next time you replace liners.

Call, wire or write your order for NORDBAK!

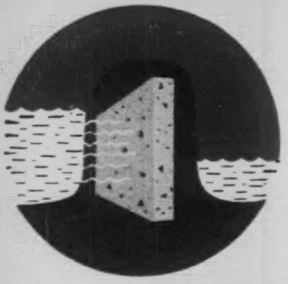
NORDBAK is a trademark of the Nordberg Mfg. Co.

N461-1/3

NORDBERG MFG. CO.

Milwaukee 1, Wisconsin

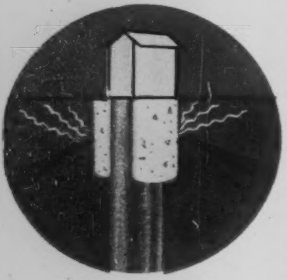
HOW HALLIBURTON GROUTING VERSATILITY SOLVED THESE PROBLEMS



WATER RESERVOIR LEAKAGE

Irvine, Ky. — A reservoir adjacent to the Kentucky River was losing considerable water through permeable stratum beneath the reservoir dam. SOLUTION: Halliburton Pressure Grouting Service was engaged to build a cutoff "wall" through the permeable stratum. Grouting holes were drilled into the permeable stratum. Halliburton DOC (Diesel Oil Cement) grout was selected because of its ability to set almost immediately when contacted by water. Water leakage from the reservoir was completely halted.

SALT MINE WATER INTRUSION



Avery Island, La. — The wall of this 15′ x 20′ ventilation and access shaft, 508′ deep, is formed of open salt except for a concrete caisson lining the top thirty feet. Water had dissolved the salt behind the concrete at the caisson base, allowing water intrusion into the shaft. The water was dissolving and eroding the walls all the way to the mine floor. SOLUTION: Halliburton studied the problem and simulated these subsurface conditions for a long series of experimental injection tests prior to presenting a grouting plan for approval. It was decided to inject Halliburton Bloxall chemical grout at unusually low pressures and volumes to effect a water-tight seal between the salt dome and overburden without adversely affecting the salt, and to consolidate the fine water-bearing sand surrounding the shaft. Two concentric perimeters of grouting holes were drilled around the shaft. Pipe was placed in the holes and perforated at carefully selected depths with Halliburton's perforating tool. Accurate injection pressures were maintained at exacting levels by Halliburton's versatile six-plunger grouting pump. Pressure tests and observation after the job determined that the shaft was dry following this treatment and indicated that the surrounding formation was consolidated.

COMPRESSOR STATION VIBRATION

Wichita, Kan. — Excessive vibration in this compressor station building and surrounding area was apparently being caused by harmonic action of the compressors plus the inability of loose sand underlying the foundation to adequately anchor the structure. SOLUTION: A pattern of grouting holes were drilled through the floor of the building and into the unconsolidated sand formation. Halliburton Chemical grout was selected because it was necessary to actually penetrate the pore spaces of the loose sand. Following the chemical grout placement through perforations, the loose sand was consolidated and tied together, thus eliminating the damaging effects of vibration on equipment and protecting gas lines leading into the building.

CONSULT YOUR HALLIBURTON GROUTING SPECIALIST for more details on helping you solve these and many other difficult problems with the advanced techniques of Halliburton Pressure Grouting Services. He is as near as your phone.

PRESSURE GROUTING SERVICES

Halliburton is financially able to perform any size grouting operation as a prime or sub-contractor

Halliburton
COMPANY • DUNCAN, OKLAHOMA

. . . Yellowtail Dam

Bid : 4-11-61		Quan-	Unit Prices	
Items	Unit	tity	1 C	2
Gate frame, intake fixed-wheel, one, Grapevine Tunnel	ls	job	5,800	3,400
river outlets bhd, for two intakes	ls	job	7,750	3,500
Gates, four fixed-wheel, in penstock intakes*	ls	job	34,000	29,000
Gate, one bhd, for river-outlet intakes incl steel erection & storage masts*	ls	job	2,250	2,600
Hoists, four, for penstock fixed-wheel gates	ls	job	21,500	17,000
Hydraulic control sys, four, for penstock fixed-wheel gate hoists*	ls	job	10,500	4,708
Seats & guides, for stop-logs & draft-tube bhd gates*	lb	435,000	0.10	0.25
Stop-logs, install & store	ls	job	25,000	33,000
Gates, bhd, 12 draft-tube*	ls	job	7,750	13,000
Lifting frames*	ls	job	950.00	5,500
Gate, high pressure*	ls	job	1,450	700.00
control & air-in piping	ls	job	19,500	3,600
two radial 25'x64.4', & embedded metalwork*	ls	job	52,500	68,000
Hoists, two radial gate*	ls	job	9,500	8,000
Metalwork, embedded, for counterweights, two radial gate hoists	lb	3,500	0.55	0.64
Gates, two ring-follower, 84"*		job	8,500	7,250
Vlvs, two hollow-jet, 84"*		job	3,800	5,500
Hydraulic control sys for two 84" hollow-jet vlvs & two 84" ring-follower gates*	ls	job	7,750	5,000
Grounding sys	lb	12,100	3.40	2.92
Cond, embed elec rigid met				
½"φ	lf	550	1.90	1.70
¾"φ	lf	11,100	1.95	1.90
1"φ	lf	5,200	2.40	2.08
1½"φ	lf	3,000	2.90	2.85
2"φ	lf	2,500	3.90	3.55
2½"φ	lf	800	5.80	4.26
3"φ	lf	3,400	6.80	5.25
3½"φ	lf	1,500	7.75	6.34
4"φ	lf	250	7.80	7.46
Outlet boxes, #1	ea	175	11.60	12.40
#2	ea	250	12.50	17.70
Cond, elec met, in duct bank, dam to spillway, 2"	lf	4,200	3.90	1.95
Pipe, drain, duct bank pull box	lf	100	6.80	1.59
Pwr recp out, compl w/encl & matching plugs				
600-v, 100-amp	ea	10	95.00	112.50
600-v, 60-amp	ea	10	78.00	72.00
Lgt fix, parapet, w/housing & instl housing only in parapets, f only	ea	36	225.00	214.50
Str, w/maximum pole lgs				
tp HS, 60' poles	ea	1	580.00	1,080
65' poles	ea	1	535.00	1,120
tp IISB, 65' poles	ea	1	535.00	1,220
tp 3A, 65' poles	ea	1	780.00	1,310
tp 3AT, 60' poles	ea	1	780.00	1,430
tp 3T, 65' poles	ea	1	950.00	1,425
tp 3TX, 80' poles	ea	2	390.00	2,010
X braces for,				
12' pole spacing	ea	1	95.00	62.00
24' pole spacing	ea	4	165.00	190.00
Guys, single	ea	4	58.00	58.00
double	ea	47	116.00	73.00
protectors	ea	18	19.50	17.00
plate or cone anchors	ea	45	39.00	97.60
grouted anchors	ea	6	29.00	130.00
Suspension insulator assemblies, attach to wood-pole str, single-string,				
w/7 insulator units	ea	18	48.00	995.00
w/9 insulator units	ea	3	68.00	125.00
Tension insulator assemblies, attach to wood-pole str, double-string,				
w/9 insulator units	ea	6	87.00	260.00
single-string				
w/9 insulator units	ea	21	48.00	205.00
Conductors, three, 397,500-circular mil ACSR	mile	0.96	4,500	5,150
Ground wires, galv-steel, overhead,				
two high-str, ⅜"	mile	0.65	1,400	2,160
two extra high-str, ⅜"	mile	0.31	2,100	2,200
Vibration dampers, attach to conductor, 397,500-circular mil ACSR	ea	48	44.00	19.50
Vibration dampers, attach to overhead ground wire	ea	32	39.00	16.50
Convert tp 3T str to tp 4BT	ls	job	1,950	2,000
Remove suspension insulator assemblies from exist tp 3T str & re-install in new tp 3T	ea	3	78.00	100.00
Thermometers, sets	ea	11	195.00	155.00
Instruments, groups	ea	95	320.00	310.00

Schedule B, service roads to top of dam, powerplant, spillway

Bids: 4-11-61	Unit	Quan-	Unit Prices	
Items		tity	1C	2
Exc, all cl, roadway	cy	231,000	0.85	1.90
common, for str	cy	460	2.70	4.70
rock, for str	cy	640	9.30	15.30
Watering	gal	840,000	4.70	5.00
Rolling embankments	hr	240	18.50	8.10
Overhaul of exc, roadway	mi cy	22,200	0.30	0.18
Backfill, compacted	cy	970	7.00	6.00
Paving, dry-rock	sy	30	3.60	50.00
CMP, 24"φ, 14 gage	lf	1,212	8.00	11.00
30"φ, 14 gage	lf	110	9.80	11.00
36"φ, 12 gage	lf	138	15.00	17.00
24"φ, 14 gage, spillway sta 3+75 on switchyard road	lf	80	12.70	10.00
24"φ, 14 gage, spillway sta 6+50 on switchyard road	lf	76	13.00	10.00
Guardrail, beam tp	lf	600	4.30	8.00
Guard & hand rail comb	lf	300	4.80	11.00
Timber bumper	lf	300	8.20	12.10
Posts, guard	ea	80	11.50	18.00
Base, crushed-rock	t	10,000	3.70	3.00
Surfacing, gvl or crushed rock	t	4,110	3.60	2.80

*installation only

Completion time: 1,980 calendar days
ENR Construction Cost Index (1913=100) 20-cities average—837.58

Cemetery Relocations Add to Construction Costs

Moving 1,025 graves, to prevent their flooding by waters impounded by the Hartwell Dam and Reservoir, adds $23,494 to the project's cost, less than half of the engineer's estimate. U.S. Engineers, Savannah, Ga., are relocating all cemeteries at the site in Georgia and South Carolina that are above the 630-ft contour.

The Little-Davenport Funeral Home, Inc., Gainesville, Ga., 41% under second low, F. M. Swett, Wake Forest, N. C., and 55% below the high of four bidders, will carry out the disinterment and reinterment of remains.

Minimum wage rates include: carpenters, $2.50/hr; laborers, $1.35; bulldozer operators, $2.15; truck drivers, flat racks and others not to exceed 3-ton, $1.45/hr.

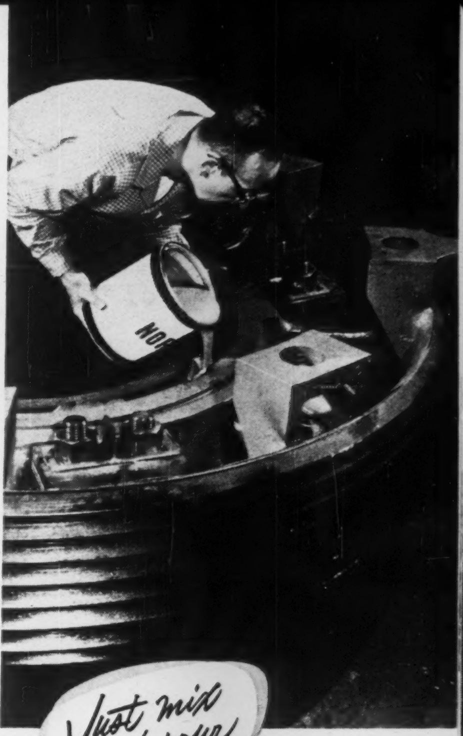
The bidding included:

1C	Little-Davenport Funeral Home, Inc., Gainesville, Ga	$23,494
2	F. M. Swett, Wake Forest, N. C.	39,958
4	E. L. Colburn, Westville, Okla	52,471
EE	U. S. Army Engineers, Savannah, Ga	47,644

Bids: 4-6-61		Quan-	Unit Prices	
Items	Unit	tity	1 C	2
Graves, backfill old, develop new, boxes & markers; disinterment, trans, & reinterment of remains	ea	1,025	$20.76	$35.00
Site development, new, incl clear & grub, grassing, grading, rds, drives, & ditches	ls	job	500.00	985.00
Relocation, monuments, headstones, markers, fences, copings, walls	ls	job	700.00	975.00
Options for new sites, New Hope Baptist Church Cemetery	ea	1	75.00	75.00
Murphy Cemetery (relocate)	ea	1	200.00	200.00
Burial encasements, perpetual Old Hepzibah #1, Baptist Church Cemetery	ea	1	400.00	400.00
Pleasant Grove Baptist Church Cemetery	ea	1	200.00	200.00
Conc pipe, 12"	lf	32	40.00	48.00
Grassing, 1,239 graves relocated under previous contract	ls	job	100.00	1,200

ENR Construction Cost Index (1913=100) 20-cities average—837.58

(Unit Prices cont. on p. 125)



NORDB
NORDB

CIRCLE 123 ON READER SERVICE CARD→

Just mix and pour

NORDBAK

It's Simple, Safe and Sure...

It had to happen . . . someone was bound to find a way to end the problems of backing manganese crusher parts with molten metal!

Now . . . you can do it with NORDBAK!

It's mixed at "room temperature" and poured right from a can into the crusher cavities. Gone is the need for special melting and pouring equipment . . . and gone are the hazards of pouring hot metal.

An initial, low cost order to back one set of crusher parts will prove the many advantages of NORDBAK . . . *call, write or wire your order today!*

N261-1/3

NORDBERG MACHINERY

NORDBAK is a trademark of the Nordberg Mfg. Co.

NORDBERG MFG. CO.
Milwaukee 1, Wisconsin

ten minutes ago...

the payload was men. They were making short work of a pre-bid site inspection. In another few minutes this Hiller will be speeding top brass to a project site...giving customers the big picture of job progress...or airlifting replacement parts to head off a costly work stoppage. Properly used, helicopters make real sense when time is valuable...sites, remote or inaccessible. Field-proven Hiller helicopters—proven in both military and civilian operation—are on record as the safest, most powerful of the nation's light helicopters. To learn the most practical and economical way to put a helicopter to work for you, it will pay you to get the brochure "On Target"—a guide to buying . . . chartering . . . leasing a Hiller. Write the Hiller Commercial Division, today. Specify "On Target".

HILLER
AIRCRAFT CORP.
PALO ALTO, CALIFORNIA
SUBSIDIARY OF THE ELECTRIC AUTOLITE COMPANY

CIRCLE 124 ON READER SERVICE CARD

Cutting through towns boosts cost of . . .

Massachusetts Highway Extension

M. DeMatteo Construction Co., Boston, took the contract for this 2.9 mile addition to Interstate Rte. 495 including eight bridge structures for $4,037,874. This was 3.5% under Campanella & Cardi Construction Co., Warwick, R. I., second low, and 26% under the high of seven bidders.

The new section goes through the towns of Chelmsford, Lowell, and Tewksbury, and piles up $11,265 for removal of seventy-seven structures. It will require 328,000 cu yd of roadway excavation at $0.45 a yard. Roadway excavation bid prices ranged from a low of $0.40 a yard to a high of $0.70.

There will be two 36-foot roadways with two 10-foot shoulders. Roadway surfacing requires 40,250 tons class I bituminous concrete pavement, type I-1 at $5.65 a ton with a spread in bid prices from $5.60 to $6.00.

Wage rates include: skilled labor, $4.35/hr; semi-skilled, $3.30; common, $2.85; power shovel operator, $4.68; and tractor operator, $4.28.

The bidding included:

1C	M. DeMatteo Const. Co., Boston, Mass.	$4,037,874
2	Campanella & Cardi Const. Co., Warwick, R. I.	4,186,260
7	Coleman Bros. Corp., Boston, Mass.	5,471,575
EE	Department of Public Works	4,357,795

Bids: 4-25-61 Items	Unit	Quantity	Unit Prices 1C	2
Clear & grub	ac	132	$200.00	$550.00
Exc, roadway earth	cy	328,000	0.40	0.40
post	cy	134,000	0.25	0.38
cl A, rock	cy	17,300	2.00	1.90
loam, & stacked	cy	73,000	0.30	0.35
bri	cy	8,200	2.00	2.75
cl A, trench	cy	5,000	1.50	2.25
cl B, trench	cy	1,600	3.00	2.50
cl B, rock	cy	350	10.00	10.80
Catch basin or MH, aband	ea	35	20.00	30.00
Borrow, ordinary	cy	1,369,000	0.50	0.55
gravel	cy	157,500	1.00	1.00
sand	cy	3,700	4.00	3.50
gravel, bri fdn	cy	2,030	2.00	1.25
Backfill, select mat, peat	cy	139,000	0.50	0.70
Paving & rolling, fine, in paved area	sy	260,000	0.10	0.10
Grade & finish, other than paved area	lf	43,000	0.50	0.50
Stone, crushed, base course	t	61,600	2.80	2.80
bri fdn	t	4,350	2.80	3.20
Bit, rdwy base course	gal	391,000	0.125	0.12
Rdwy dust contr, cal chlor	lb	125,000	0.04	0.05
bit	gal	50,000	0.135	0.14
Stone, crushed, macadam surf	t	91,000	0.125	0.12
Bit, macadam surf	t	4,900	2.80	2.90
peast cover, pre-treat	t	150	5.00	5.20
Bit conc pvmt, cl 1, tp 1-1	t	40,250	5.65	5.80
tack coat	gal	8,100	0.26	0.24
conc berms, tp B-1	t	8	12.00	10.80
tp B-2	t	490	12.00	10.80
tp B-4	t	290	12.00	10.80
Rubble, gran, block pvmt	sy	525	10.00	9.50
Steel, sheeting	lb	152,390	0.15	0.17
Msry, cmt conc, cl A	cy	280	45.00	43.00
seal	cy	620	25.00	27.50
cl B	cy	80	41.00	42.50
cl C	cy	550	55.00	45.00
Steel, reinf, for str	lb	45,000	0.12	0.12
Waterproofing, membrane	sy	350	2.00	1.85
prot course	sy	350	2.00	1.75
Dampproofing, bit	sy	500	0.63	0.70
Msry, field stone, dry	cy	10	35.00	40.00
Riprap	cy	1,650	7.00	7.00
Paving, spec slope, (Q St.), or granite face pr conc block	sy	6,700	7.00	8.50
Piles, steel, 12BP53	lf	1,920	6.50	5.50
10BP42	lf	15,995	4.60	4.60
splices, 12BP53	ea	7	50.00	45.00
12BP42	ea	42	35.00	40.00
Cofferdams	ea	2	20,000	25,000
Catch basins	ea	217	156.00	185.00
city of Lowell	ea	5	277.00	190.00
Manholes	ea	15	168.00	190.00
9′-14′ depth	ea	2	284.00	255.00
Catch basin, city of Lowell except cost of cstg	ea	16	240.00	165.00
MH, city of Lowell*	ea	2	262.00	165.00
9′-14′ depth*	ea	1	766.00	265.00
14′-18′ depth*	ea	1	1,240	420.00
special	ea	3	700.00	405.00
Inlets, drop, tp C	ea	31	149.00	180.00
gutter	ea	8	119.00	180.00
MH, catch basin, or LB, adj to L/G*	ea	17	35.00	30.00
VCP, 6″	lf	300	2.40	2.75
RCP, 12″	lf	8,200	3.00	3.10
15″	lf	1,600	3.80	3.60
cl IV	lf	125	4.20	4.20
18″	lf	2,030	4.85	4.25
cl IV	lf	150	5.30	5.15
24″	lf	1,000	6.70	6.35
cl IV	lf	260	7.50	7.10
cl V	lf	190	7.90	7.50
30″	lf	820	8.85	8.25
36″	lf	90	12.50	11.20
4,000D	lf	320	14.60	13.25
42″	lf	290	15.30	14.00
6′ 4″ x 4′ 0″	lf	110	44.50	46.00
6′ 11″ x 4′ 5″, cl V	lf	310	67.00	74.00
ACCMP, 12″	lf	3,400	3.70	4.40
15″	lf	65	4.00	5.00
arch, 18″x11″, 16 ga	lf	215	4.60	5.30
Storm drain, w/ACCMP perf, or PCP, or asb cmt perf pipe underdrain	lf	320	3.10	3.25
Culv, pipe, remove & relay, 12″	lf	115	2.80	2.35
24″	lf	65	5.00	3.55
42″	lf	75	10.50	5.25
Cobble, grout, street pvmt	sy	4,200	5.30	4.75
Posts, square, indiv	ea	250	8.60	8.65
Guard, hwy, tp C3S	lf	31,000	1.70	1.69
anchors	ea	140	42.00	42.00
steel beam, tp SS	lf	2,500	2.70	2.70
Posts, indiv, remove & reset	ea	5	4.20	4.20
stack	ea	5	0.52	0.55
Fence, stock	lf	1,350	0.42	0.42
chain link, 72″	lf	10,300	3.00	3.00
w/barbed wire	lf	1,260	3.10	3.05
w/barbed wire & guard posts	lf	40	11.55	11.50
iron pipe	lf	175	7.80	7.75
remove & reset	lf	70	0.84	0.85
chain link, remove & reset	lf	90	0.94	0.95
barrier	lf	125	9.45	9.50
portable	ea	20	94.50	95.00
remove & stack	lf	275	0.20	0.25
chain link, remove & stack	lf	1,120	0.32	0.35
Curb, granite, tp VA3, straight	lf	720	3.26	3.40
curved	lf	170	4.20	4.95
tp VA4, straight	lf	6,100	3.10	3.15
curved	lf	2,200	4.10	4.50
inlets, straight	ea	215	30.20	34.00
curved	ea	16	35.50	40.00
corners, tpB	ea	20	26.00	30.00
Edge, granite tp SB straight, or granite face precast conc tp B	lf	23,400	1.50	1.50
granite tp SB, rad 10′ or less, or granite face, or precast conc, tp B, curved	lf	85	2.40	5.25
Curb, remove & reset	lf	4,100	1.50	1.10
inlets, remove & reset	ea	4	9.20	7.00
corners, remove & reset	ea	35	4.50	4.30
Conc, sidewalk, 1-course	sy	200	4.50	4.60
Bit conc, walk surf	t	600	13.00	10.80
Cond, traffic signal	lf	4,100	1.20	1.20
Bounds, lettered, f & set	ea	105	24.00	24.50
plain, f & set	ea	15	16.80	16.75
Mail boxes, rural, remove & reset	ea	5	8.90	8.90
Bri str, C-8-38	ls	job	147,000	146,000
C-8-39	ls	job	163,000	168,600
L-15-82	ls	job	272,000	260,000
L-15-83	ls	job	219,000	217,000
L-15-84	ls	job	148,000	138,000
L-15-85	ls	job	153,000	141,000
L-15-86	ls	job	220,000	216,000
T-3-15	ls	job	168,000	166,600
Culv, at RR sta 22+0	ls	job	19,000	11,500
Pull boxes	ea	3	79.00	75.00
Beacons, flash warn (3)	ls	job	3,600	4,150
Bldg, field office, port, move	ls	job	1,700	1,200
sanitary, port, move	ea	1	2,000	1,300
Loam, rehandle & spread	cy	20,500	1.10	1.00

(Continued on page 126)

CIRCLE 125 ON READER SERVICE CARD→

Just mix and pour

NORDBAK

It's the modern, effective way to back manganese

Non-metallic NORDBAK streamlines crushing operations of every kind. It's as easy to use out in the field as it is in the plant. You mix it and pour it right on the job...*wherever* your crusher is. No need for special melting or pouring equipment. Use it in gyratory crushers, cone crushers, grinding mills and other machinery where backing agents are required.

NORDBAK fills voids as narrow as 1/8″ and is only 1/4 the weight of other backing agents. Conveniently packaged, NORDBAK is *the one* modern, effective backing agent for manganese crusher parts!

Call, wire or write your order for NORDBAK!

N361-1/3

NORDBAK is a trademark of the Nordberg Mfg. Co.

NORDBERG MFG. CO.

Milwaukee 1, Wisconsin

100 years of experience back ROBINSON'S 100-year guarantee*

NEW CLAY PIPE!

Robinson Clay Pipe has undergone so many improvements it's an *all-new product:* longer, stronger, truer, straighter. New longer lengths save time, keep projects on schedule. Greater density from new vacuum forming adds strength to take deep-backfill and live traffic loads. Wedge-Lock®, Wedge-Lock® Type "O" and Slip Joint factory-made joints protect against infiltration and roots. No wonder this New Clay Pipe can be guaranteed for a hundred years!

**Write for a copy of the 100-year guarantee certificate.*

Wedge-Lock and Wedge-Lock Type "O" conform to ASTM Designation C425, Type I and Type III.

THE
ROBINSON
CLAY PRODUCT CO.
ESTABLISHED 1856
AKRON 9, OHIO

R-661-98

Akron, Ohio • Albany, N.Y. • Baltimore, Md. • Boston, Mass. Buffalo, N.Y. Caldwell Township, N.J. • Chicago, Ill. • East Hartford, Conn. • Indianapolis, Ind. New York, N.Y. • Philadelphia (Pottstown, Pa.) Rochester, N.Y. • Syracuse, N.Y. • Toronto, Ontario, Canada • Yonkers (Westchester County), N.Y.

. . . Massachusetts Highway

Bids: 1-10-61 Items	Unit	Quantity	Unit Prices 1 C	2
Borrow, peat	cy	2,900	1.10	1.10
Water main, CI, 6"	lf	1,350	4.60	3.90
8"	lf	3,350	6.00	4.70
10"	lf	210	7.40	5.80
MJ, 8"	lf	920	4.00	4.75
Pipe, asb cmt, 4"	lf	25	4.00	2.65
6"	lf	2,400	3.40	3.20
Ftg, CI water main	lb	9,000	0.40	0.38
Hydrant, f&i	ea	3	250.00	265.00
exc cost	ea	1	75.00	85.00
remove & reset	ea	11	150.00	110.00
Pipe, WI serv, ¾"	lf	35	3.50	3.00
Tubing, copper, tp K, 1"	lf	230	3.50	3.00
Vlv, gate ¾"	ea	2	20.00	12.00
4"	ea	1	57.00	270.00
Gates & gate boxes, ¾"	ea	1	30.00	35.00
6"	ea	8	123.00	105.00
8"	ea	4	158.00	155.00
10"	ea	1	210.00	230.00
remove & reset, 6"	ea	8	65.00	55.00
8"	ea	1	84.00	85.00
Gate boxes, 8"	ea	1	25.00	22.00
Vlv, air	ea	3	50.00	75.00
Gate boxes, adj	ea	12	15.00	25.00
& gates, exc cost of cstg, 6"	ea	1	39.00	42.00
Service boxes	ea	9	20.00	10.50
adj	ea	7	15.00	25.00
Meter assembly, remove reset	ls	job	400.00	400.00
Curb stops	ea	9	20.00	40.00
Cocks, corp, w/copper gsnks	ea	8	50.00	42.00
Plugs, CI, water main, 6"	ea	2	25.00	9.00
8"	ea	2	34.00	12.65
Sleevs, taping, 6" x 8", vlv & boxes	ea	2	262.00	230.00
Meter chambers	ea	1	600.00	875.00
Insulation, water pipe ¾"	lf	35	5.00	5.00
8"	lf	920	8.00	8.50
Structure removal, #1-#77	ls	job	11,265	20,575

* excl cost of cstg

Completion time: 790 calendar days

ENR Construction Cost Index (1913=100) 20-cities average —837.58

Highway Bid Price Trends in New York

Selected unit prices for 1958-60 showing weighted averages of contract prices from 10 districts. Department of Public Works, Division of Construction, State of New York

Items	Unit	1958	1959	1960
Applying water	Mgal	$2.137	$1.987	1.965
Excavation, uncl	cy	0.752	0.555	0.552
trench, culv & bridge	cy	4.045	3.039	2.931
Overhaul	sy	0.005		
Trimming road section	lfrd	0.570	0.505	0.523
Preparing fine grade	sy	0.247	0.221	0.226
Sewer pipe vit 4"	lf	2.173	2.657	2.768
6"	lf	3.420	3.078	3.441
8"	lf	3.175	2.967	5.183
10"	f	5.118	3.898	5.430
12"	lf	7.317	6.842	7.790
15"	lf	12.257	10.654	10.356
18"	lf	17.652	15.358	14.125
24"	lf	21.129	15.864	19.626
Underdrain VCP 4"	lf	1.000		0.901
6"	lf	1.000	1.007	0.932
Cor met pipe heavy 12"	lf	4.686	4.417	4.174
15"	lf	5.676	5.938	
18"	lf	6.151	5.925	5.474
24"	lf	9.918	9.567	8.804
30"	lf	14.724	16.149	12.387
36"	lf	17.901	19.180	16.332
Cast iron pipe 6"	lf	4.932	4.696	4.446
8"	lf	7.302	6.250	5.197
12"	lf	8.392	11.740	11.682
18"	lf	16.186	21.048	
20"	lf	22.000		
24"	lf	29.164	23.831	
Reinf conc culv pipe 12"	lf	5.000	4.589	4.563
15"	lf	5.613	5.666	5.548
18"	lf	7.209	6.849	6.300
24"	lf	10.057	9.954	9.255
30"	lf	13.858	13.553	12.492
36"	lf	17.370	17.319	15.286
48"	lf	26.168	29.339	24.855
54"	lf	42.139	34.030	28.189
60"	lf	41.516	45.188	40.334
Reinf conc sewer pipe 12"	lf	4.388	4.354	4.410
15"	lf	4.903	5.026	
18"	lf	6.246	6.292	6.184
24"	lf	8.952	9.263	9.193
30"	lf	11.794	13.050	11.437
Portland cement:				
Type 2	bbl	5.078	5.207	5.002
Type 2A	bbl	4.896	4.912	4.821
Type 6A	bbl	11.382	10.524	12.080
Natl cmt, type N	bbl	5.596	5.704	5.700
Conc for struct cl 1A	cy	58.674	55.651	58.665
Cl 1	cy	48.268	44.162	48.014
Cl 2	cy	38.393	48.386	49.219
Cl 3	cy	27.477	33.819	29.100
Masonry, stone	cy	185.640	185.000	
Met reinf, conc pave	sy, p	0.976	0.922	0.921
Steel fab reinf	sy	0.862	1.045	0.845
Bar reinf, conc pave	lb	0.158	0.174	0.166
Trans jt supports	lfjt	1.721a	1.676a	1.820
Longit jt supports, opt	ea	0.858	0.823	0.745
Bar reinf for structure	lb	0.153	0.141	0.140
Spiral bar shear connector	lb	0.594	0.523	0.517
Structural steel	lb	0.172	0.148	0.164
Misc metals	lb	0.288	0.245	0.279
Opt. guide railing	lf	2.657b	2.596b	2.747
Opt. guide posts	ea	9.550	8.879	9.127
Fndn crse ROB gravel	cy	1.821	1.622	1.555
Bott crse broken stone	cy	7.695	7.202	6.674
bit mac pen meth asph	cy	8.777	8.889	8.610
Conc fndn for pavement	cy	14.345	13.228	13.887
Cmt conc pavement with carbon black	cy	15.441	15.109	15.670
Asphalt concrete tp 2A	t	11.929	11.694	10.320
Top crse bit mac tp 1, pen method hot asph	cy	9.604	8.621	9.652
Membrane waterproofing	sy	3.302	3.400	4.003
Prot crse for membr waterproofing	sy	5.424	5.308	5.376
Paving asph, pen constr	gal	0.178	0.168	0.141
T road tar c	gal	0.270	0.260	0.254
T road tar d	gal	0.265	0.232	0.253
Stone filling	cy	4.646	4.292	4.485
Dry stone paving	sy	6.713	7.334	8.568
Riprap, dry	cy	13.375	13.706	12.575
grouted	cy	21.885	19.105	21.192
Sheet piling timber	sf	1.239	0.431	0.610
Timber piles, untreated	lf	2.440	2.229	2.321
creosoted	lf	1.938	1.830	2.150
Piles, conc, 12x3 3/16", cip	lf	4.815	4.805	4.779
Clean existing pavement	mi	163.889	146.291	119.209
	sy	0.076	0.053	0.072
Screened gravel, LM	cy	5.482	8.297	6.382
Reset old curb	lf	3.578	2.839	2.919
Conc curb, type C	lf	3.464	3.688	1.435
reflecting, tp ABR	lf	2.500	3.000	2.500
gutter, general	sy	6.022	6.908	6.074
Catch basins, manholes & drop inlets	cy	68.418	59.741	64.586
Alter manhole & catch basin	ea	65.530	67.050	55.793
Conc rt of way marker	ea	9.414	9.038	9.175
sidewalk, 6"	sy	5.776	5.113	5.066
Timber & lumber	Mfbm	117.453	247.739	275.965
stress graded	Mfbm	363.682	500.000	404.159
creosoted	Mfbm	406.010	456.830	461.314
Relay old pipe	lf	2.384	2.806	2.677
Emuls carbon black	lb	0.104	0.101	0.101
Highway RR barricade	lf	9.121	8.942	8.778
Reflect hwy-RR xing signs	ea	178.428	252.083	218.000
Topsoil f&p	cy	2.862	2.831	2.913
from stock pile, place	cy	1.115	0.973	0.943
Seeding	ac	291.065	275.910	278.490
Mulching	ac	189.843	156.111	150.000
Sodding	sy	1.437	1.304	1.434

a Dowel type b Cable guide railing c Surf treat rd mix, premix & seal ct d Prime coat & light surf treat

Alaska Average Unit Prices—Highway Construction 1959-1960

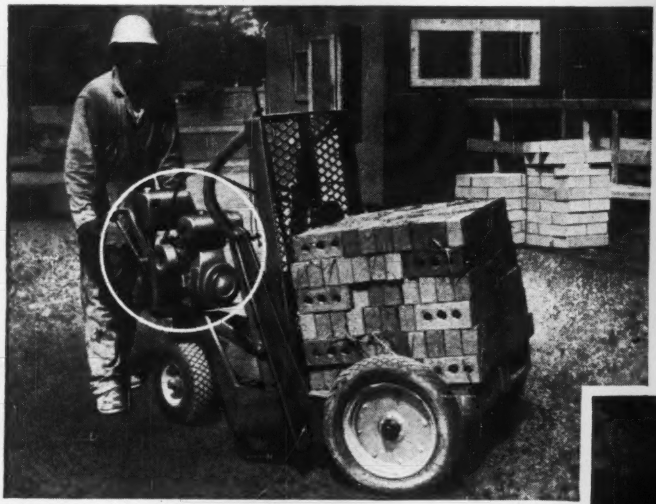
Information source: Department of Public Works, State of Alaska[a]

Items	Unit	1959	1960
Clear & grub	ac	$1,200	$1,125
Excavation, unclassified	cy	1.12	1.10
borrow	cy	0.77	0.78
Haul	ymi	0.30	0.25
Aggregate, crushed, base	t	2.41	2.32
surf	t	7.61	7.59
Liquid asphalt	gal	0.30	0.27
Conc, hot bituminous	t	12.50	8.00
Excavation, structures	cy	11.00	10.94
Culverts, corr metal[b]	lf	17.15	17.20
Piling, treated timber	lf	11.73	11.62
steel	lf	10.50	10.51
Steel, structural	lb	0.39	0.36
Conc, structural	cy	170.00	171.11
Timber, structural	Mbm	761.26	724.48
Riprap	cy	6.00	5.88

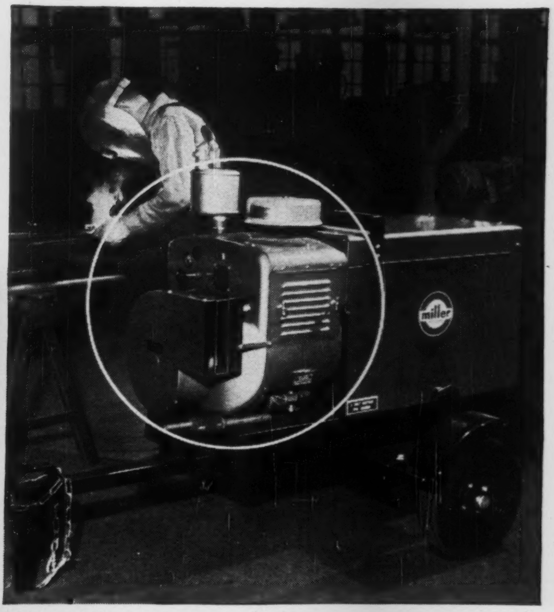
a the State of Alaska assumed control of the highway program in July, 1960. Prior to that time all work was administered by the Bureau of Public Roads.
b average for all sizes

(Unit Prices cont. p. 130)

Service is important
to these
Kohler engine users

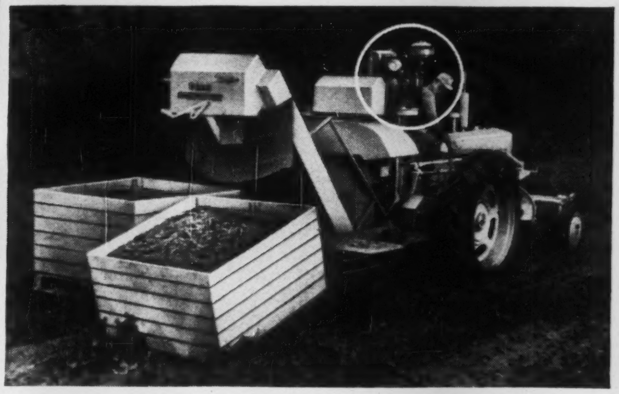


CONSTRUCTION



INDUSTRY

These men know Kohler engine service



AGRICULTURE AND GARDENING

KOHLER ENGINE SERVICE is skilled, nation-wide.

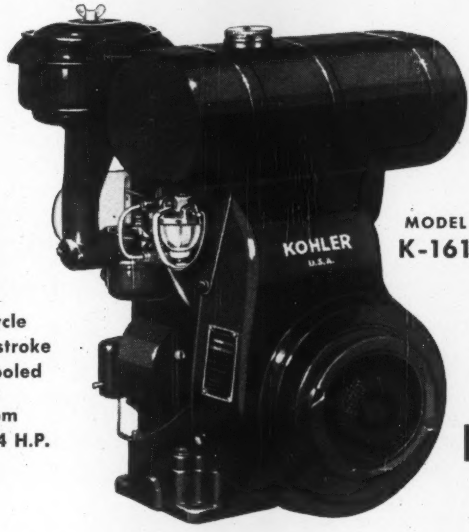
It's handled by specialists to save down-time costs.

They learn their job at the Kohler Service Training School, located in the huge new engine and electric plant building at Kohler, Wisconsin and are thoroughly instructed in every aspect of engine service, application and maintenance.

Authorized distributors and dealers stock and are ready to install any Kohler engine parts you need.

Write Dept. M-19 for information about Kohler Engines

KOHLER CO. *Established 1873* KOHLER, WIS.

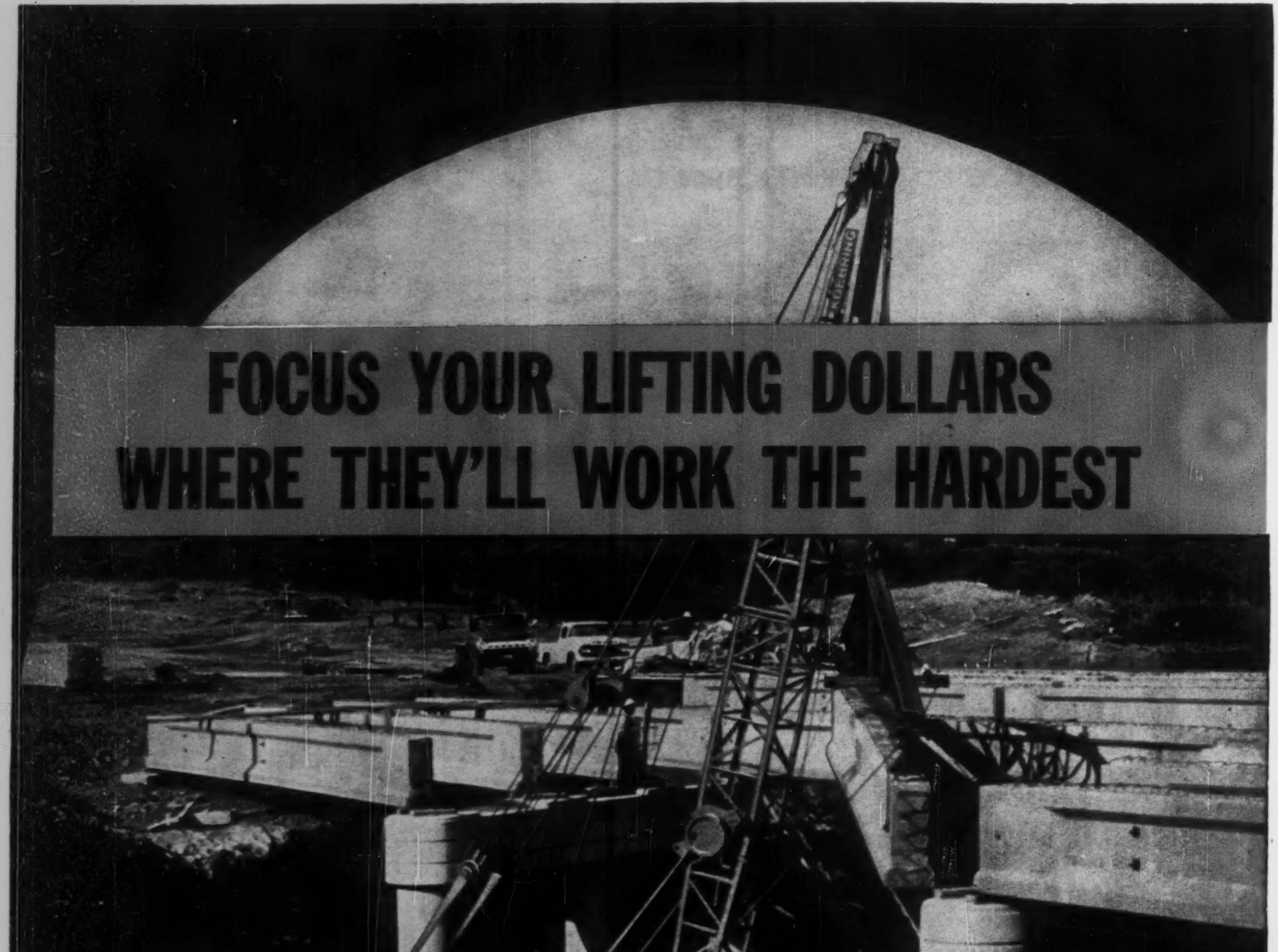


MODEL
K-161

4-cycle
Short stroke
Air-cooled
•
From
4 to 24 H.P.

KOHLER OF KOHLER

ENAMELED IRON AND VITREOUS CHINA PLUMBING FIXTURES • ALL-BRASS FITTINGS
ELECTRIC PLANTS • AIR-COOLED ENGINES • PRECISION CONTROLS


FOCUS YOUR LIFTING DOLLARS
WHERE THEY'LL WORK THE HARDEST
KOEHRING

KOEHRING 545 SPRAWLER, owned by James T. Triplett Inc. of Chester, S. C., eases heavy precast bridge member into place. Machine has pivoting outriggers (see inset) that enables it to outlift its own working weight by 14%. Maximum lifting capacity with outriggers set: 90,000-lbs,

CIRCLE 128 ON READER SERVICE CARD

Look to Koehring

Look over the big Koehring lineup of heavy-duty lifting cranes: crawler, Sprawler, truck and Cruiser models. They're heavy duty through and through, built to outlast and outlift other makes for years and years. Here's why . . .

BUSINESS END gives the operator plenty to work with: automatic power boom lowering, power load lowering, pendant boom suspension, boom limit stops, pin-pad boom connection. Makes for faster, safer load lifting and spotting . . . quicker, easier setups.

MAIN MACHINERY delivers smooth, direct power flow. Shafts are driven by cut steel gears, rotate freely on anti-friction bearings. Side stands are line bored in place to keep shafts in perfect alignment.

A MOUNTING FOR EVERY NEED. Self-cleaning, heavy-duty crawlers and rugged truck and cruiser models to meet job requirements . . . deliver maximum load stability with minimum maintenance.

K 28

SEVEN CRAWLER MODELS
FROM 10 to 95-TON CAPACITIES

TWO SPRAWLERS
30 and 45-TON CAPACITIES

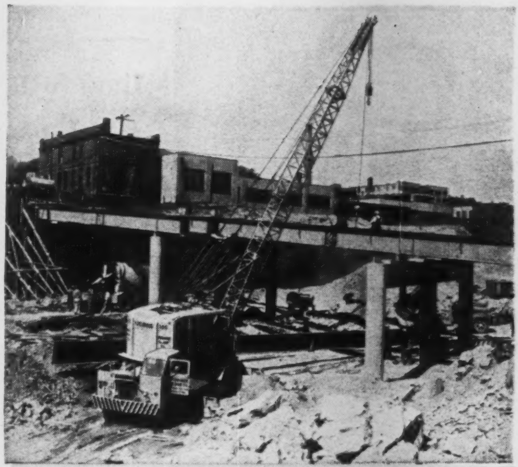
FIVE TRUCK MODELS
FROM 18 to 55-TON CAPACITIES

TWO CRUISER CRANES
18 and 25-TON CAPACITIES

See your Koehring distributor . . . or write for a bulletin on the crane of your choice.

KOEHRING
DIVISION OF KOEHRING COMPANY
Milwaukee 16, Wisconsin

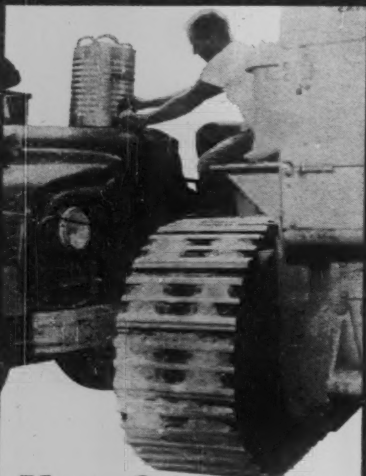
MORE WORK CAPACITY . . . MORE PROFIT PER DOLLAR INVESTED



Milwaukee Bridge Company's Koehring 305 Truck Crane hoists steel girder for bridge deck. The 305 has a maximum lifting capacity of 25-Tons.

Koehring 605 . . . 36-Ton Crawler . . . pours concrete on Texas Dam project.

Koehring 445 Truck Crane...45-Ton capacity... speeds overpass work on highway job. Ramsour Bros., Castle Rock, Colorado is the contractor.



You CAN take it with you!
IGLOO puts Drinking water exactly where you want it

. . . and WHEN you want it. IGLOO portable water coolers speed up the work and help employee relations, too. Station an IGLOO for every 6 to 8 men and see the results immediately. Select from 23 sizes and models—one will fit your exact needs. Remember, IGLOO has been time-tested and proved on thousands of tough jobs over the world.

Write for catalog.
IGLOO *Memphis 18, Tenn.*

Time factor outweighs costs for . . .

Colorado NORAD Excavation

The price tag for a 60-day speed-up on this $5.9 million air-defense headquarters is $55,487. Base bids called for completion in 425 days, B. Alternate speed up completion bids allowed 365 days, A.

The job is the Air Force's underground headquarters and access tunnels for the North American Defense Command (NORAD) deep inside Cheyenne Mountain, Colorado Springs, Colo. (ENR Mar. 30, 1961, p. 19).

Low bidder both ways, Utah Construction & Mining Co., San Francisco, took the contract on the fast schedule at $5,918,221, and will use the top heading and bench technique for driving the access tunnels. The low bid was 11.1% under the Frazier-Davis, Hunkin-Conkey joint venture bid and 38% under the high of 12 bids.

Engineers for the Air Force are the Omaha District Corps of Engineers, Department of the Army and their consultants, Parsons, Brinkerhoff, Quade & Douglas of New York City and A. J. Ryan & Associates of Denver.

How the speed up affects individual item unit prices is illustrated in the two summaries that follow the bidding schedule, where rock excavation takes the brunt of the added cost. Utah increased access tunnel excavation from $11.80 to $12.00 a yard, and exhaust tunnel work from $18.50 to $19.00 then spread increases over a broad base of other items. The Frazier-Davis, Hunkin-Conkey access tunnel rock bid at $13.00 was raised to $14.00 and the exhaust tunnel rock from $18 to $20. All the speed up increase in this bid was in rock excavation prices.

The access tunnels will form a horseshoe nearly one mile in total length. Three main chambers will each measure about 320-ft in length, 45-ft at the cross section, and 56-ft in height, the maximum size allowed by the threat of collapse of the granite walls.

Wage rates include: carpenters, $3.40/hr; cement masons, $3.35; electricians, $3.88; structural and reinforcing ironworkers, $3.71; laborers, $2.50; core drill operators, $2.93; powderman, $2.73.

The bidding included:

1C	Utah Const. & Mining Co., San Francisco, Calif	$5,862,734 B 5,918,221 A
2	Frazier-Davis Const. Co., St. Louis, Mo., & Hunkin-Conkey Const. Co., Cleveland, Ohio	6,424,077 B 6,655,077 A
12	J. A. Jones Const. Co., Seattle, Wash	8,501,995 B 9,479,195 A
EE	Omaha District, Corps of Engineers	7,732,227 B 8,127,843 A

Schedule B— 425 Day Completion Schedule

Bids: 4-11-61 Items	Unit	Quantity	Unit Prices 1C	2
Portals & Belated Work				
Slope treatment	s	job	$30,000	$14,000
Excavation, uncl				
1st 40,000 cy	cy	40,000	3.70	2.00
over 40,000 cy	cy	20,000	2.70	2.25
Concrete	cy	200	55.00	90.00
PCC	bbl	265	7.00	6.00
Reinf bars	lb	6,000	0.20	0.18
Anchor rods	lf	1,300	2.75	4.00
Rock bolts, 1st 900 lf	lf	900	1.50	3.00
over 900 lf	lf	900	1.25	3.00
Paving, asphalt	sy	225	7.00	3.00
Pipe culvert, 24"	lf	96	18.00	12.00
72"	lf	474	49.00	60.00
Riprap	sy	400	3.70	12.00
Water line, replacement, 6"	lf	700	10.00	12.00

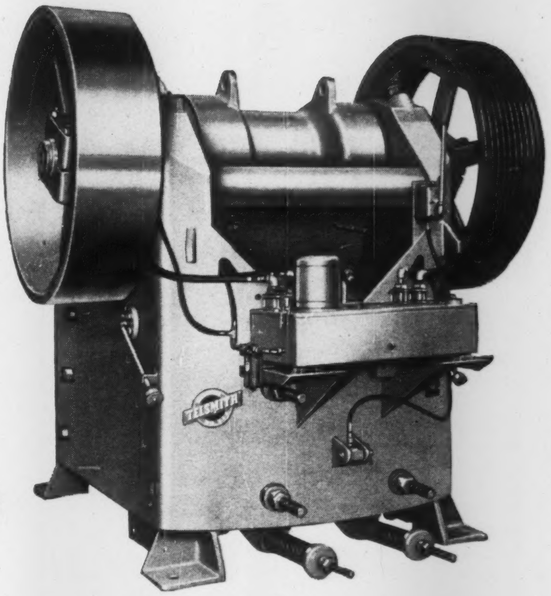
Access Tunnels Exhaust Tunnel & Exhaust Shafts

Items	Unit	Quantity	1C	2
Excavation, rock				
access tunnels	cy	86,000	11.80	13.00
exhaust tunnels	cy	22,000	18.50	18.00
enlargements	lf	1,500	1.00	3.00
Line holes, access tunnels	lf	4,000	0.45	1.50
Access to exhaust tunnel,				
north const	ls	job	31,500	30,000
south const	ls	job	17,500	15,000
Excavation, uncl, top of exhaust shafts,				
1st 500 cy	cy	500	3.70	4.00
over 500 cy	cy	600	2.70	4.00
Exhaust shafts, lined	lf	124	310.00	450.00
unlined	lf	93	65.00	240.00
Mortar, pneumatically-applied, 1st 670 bbl	bbl	670	30.00	26.00
over 670 bbl	bbl	1,400	30.00	25.00
Reinf, wire mesh,				
1st 40,000	sf	40,000	0.30	0.18
over 40,000 sf	sf	65,000	0.30	0.18
Bolts, supporting wire mesh reinf,				
1st 3,700	ea	3,700	3.05	0.60
over 3,700	ea	6,000	3.05	0.60
rock, 6'-10' length,				
1st 68,000 lf	lf	68,000	1.75	1.50
over 68,000 lf	lf	10,000	1.75	1.50
over 10' length	lf	1,700	1.80	1.15
spot rock, 6'-10' length	lf	2,500	2.20	2.00
over 10' length	lf	250	2.20	2.00
Steel, sgr, supports, in access tunnels, f&i,				
1st 290,000 lb	lb	290,000	0.30	0.35
over 290,000 lb	lb	350,000	0.30	0.30
f&delivered only	lb	50,000	0.20	0.20
In exhaust tunnel, f&i,				
1st 13,000 lb	lb	13,000	0.40	0.50
over 13,000 lb	lb	18,000	0.40	0.40
f&delivered only	lb	2,500	0.25	0.22
Ties, mine roof	lf	3,000	0.80	1.25
Chain link fabric	sf	30,000	0.45	0.45
Bolts, supporting chain link fabric	ea	400	3.15	2.00
Panning, sheet steel	lb	3,000	1.05	1.00
steel pipes	lf	450	6.60	1.50
Connections, for grouting,				
1st 50	ea	50	115.00	500.00
over 50	ea	100	115.00	325.00
Drainage facilities, outside tunnel lining	lf	550	17.00	8.50
Concrete	cy	3,200	56.00	45.00
PCC	bbl	4,200	4.85	6.00
Reinf bars	lb	280,000	0.18	0.18

Chambers and Adits

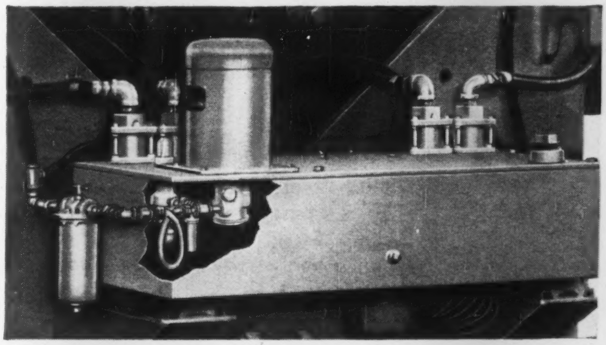
Items	Unit	Quantity	1C	2
Exc, for chmbrs excl of reservoirs, mobilization & demobilization	ls	job	357,000	560,000
rock	cy	175,000	7.00	8.00
Tunnel, exploratory pilot, add cost	ls	job	9,000	10,000
Exc, for reservoirs, mobilization & demobilization	ls	job	120,000	120,000
rock	cy	27,000	10.00	10.00
Exc, rock, enlargements	lf	1,500	1.00	3.00
Line holes, in chmbrs	lf	4,000	0.45	1.50
Mortar, pneumatically-applied	bbl	25	35.00	30.00
Reinf, wire mesh	sf	1,500	0.45	0.20
Bolts, supporting wire mesh reinf	ea	200	5.50	0.75

completely NeW AUTOMATIC OILING SYSTEM



Available as optional equipment on 30" x 42" and 42" x 48" sizes

- *bearings last longer*
- *lube costs go down*
- *capacity goes up*
- *PROFITS are BIGGER*



the ODDS are 80 to 1 in your favor

Now under severest abrasive dust conditions Telsmith Jaw Crushers run cooler at full capacity with oil changes every 4 months and *no time out for lubrication in between.* From 80 grease jobs to 1 oil change! More vital, you automatically end bearing failure due to improper lubrication. Filter-fresh oil in correct quantities circulates automatically, greatly prolongs bearing life, improves crusher performance. Find out why and how this newest jaw crusher development will save you many times its cost. Ask your Telsmith distributor.

HOW THE SYSTEM WORKS

Oil is pumped through the filter into crusher bearings and returns to the reservoir through flexible hoses. The pressure by-pass serves to insure a flow of constant pressure to the bearings and the temperature sensing device sounds an alarm if the oil temperature exceeds an acceptable limit.

The pressure-temperature control switch is mounted on the bottom of the tank for easy access. The tank can also be fitted with heating elements for cold weather starting. *Send for Bulletin 280.*

J-4-361

TELSMITH MILWAUKEE WIS. U.S.A.

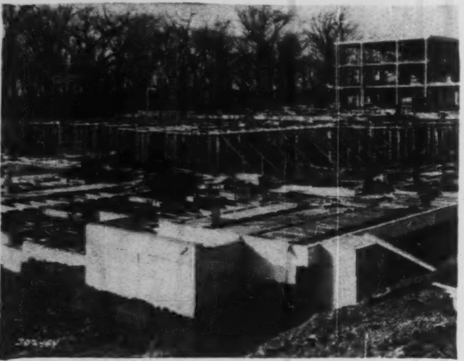
SMITH ENGINEERING WORKS
500 E. CAPITOL DRIVE, MILWAUKEE 1, WISCONSIN

DIVISION OF Barber-Greene

Cable Address: Sengworks, Milwaukee • Representatives in Principal Cities in all Parts of the World

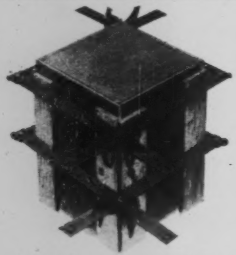
CIRCLE 131 ON READER SERVICE CARD

Small Crew Shoring
SAVES TIME and MONEY
with
ROOSHORS
THE ONE-MAN SHORE



Rooshors are the fastest method of shoring forms. You can prove that for yourself when you include all operations. Rooshors don't require any preliminary work. They are ready for use—right now. They set up fast—adjust easily—are released with the turn of a lever and the blow of a hammer.

So, when you figure all of your job time, remember Rooshors can save you money—add more profit.



ROOS COLUMN CLAMPS

Roos Column Clamps reduce material and labor costs, are fool-proof to install, can't be put on wrong. Only the simplest column forms construction is required when Roos Column Clamps are used.

Rooshors and Roos Column Clamps are rented on a monthly basis with purchase option. They are available from warehouses coast-to-coast. Write for more complete information.

BAKER-ROOS, INC.
602 WEST McCARTY STREET • INDIANAPOLIS 6, INDIANA

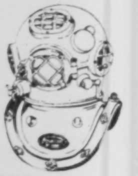
CIRCLE 9 ON READER SERVICE CARD

HOESCH

STEEL SHEET PILING
PIPE PILING
LINEPIPE

Direct mill office
American Hoesch Inc.
375 Park Avenue
New York 22, N. Y.
Plaza 3-3285

Southern Representative
Engineered Materials
Port Everglades Station
Fort Lauderdale, Fla.
Jackson 3-7617



J&J MARINE DIVING Co.

complete underwater work
24 hour worldwide service

- CUTTING
- WELDING
- SALVAGE
- DEMOLITION

Pipeline Construction Contractors

HOUSTON, TEXAS
Tel: HUdson 6-8062
OR
GReenwood 3-2159
John Galletti/Joe Carroll
P. O. Box 4117 Pasadena, Tex.

CIRCLE 13 ON READER SERVICE CARD

. . . NORAD excavation

Bids- 5-2-61 Items	Unit	Quan-tity	Unit Prices 1C	2
Bolts, rock, in roofs, 6'-10' length, mobilization & demobilization	ls	job	45,000	10,000
bolts	lf	60,000	1.80	1.50
in walls, 6'-10' length	lf	22,000	1.00	1.50
over 10' length	lf	1,300	1.00	1.50
spot rock, 6'-10' length	lf	2,000	1.30	2.00
over 10' length	lf	250	1.30	2.00
Ties, mine roof	lf	3,000	0.80	1.25
Chain link fabric, on roof, mobilization & demobilization	ls	job	7,000	5,000
fabric	sf	140,000	0.45	0.45
on wall	sf	80,000	0.45	0.45
Bolts, supporting chain link fabric, on roof	ea	2,000	3.75	2.00
mobilization & demobilization	ls	job	2,500	5,000
on walls	ea	1,200	3.75	2.00
Utility Entrances and Core Borings				
Entrances, utility, 12" hole	lf	4,500	137.00	160.00
8" hole	lf	1,500	96.00	170.00
surface recesses	ls	job	35,000	3,000
Core borings, mobilization & demobilization of plant & equip	ls	job	5,000	10,000
hole number, 1, 0-500'	lf	500	14.50	15.00
500'-1,000'	lf	500	14.50	15.00
1,000'-1,500'	lf	500	16.50	15.00
1,500-2,000'	lf	500	16.50	15.00
2, 0-500'	lf	500	14.50	15.00
500'-1,000'	lf	500	14.50	15.00
1,000-1,500'	lf	500	16.50	15.00
1,500'-2,000'	lf	500	16.50	15.00
3, 0-500'	lf	500	14.50	15.00
500'-1,000'	lf	500	14.50	15.00
1,000'-1,500'	lf	500	16.50	15.00
1,500'-2,000'	lf	500	16.50	15.00
water observations, standby time	hr	100	26.00	40.00
Access Roads				
Repair of slide, prepare	ls	job	1,500	7,500
Exc, uncl	cy	4,350	2.20	3.00
Culvert, replace	ls	job	700.00	3,500
Guard rail, hwy	lf	15,375	3.20	3.00
Miscellaneous				
Accommodations for gov't inspectors	ls	job	16,500	10,000
Seepage water, care & handling, mobilization & demobilization	100 gpm	4	1,600	5,000
pumping water	Mgal	1,000	0.85	10.00
Total Schedule B			5,862,734	6,424,077

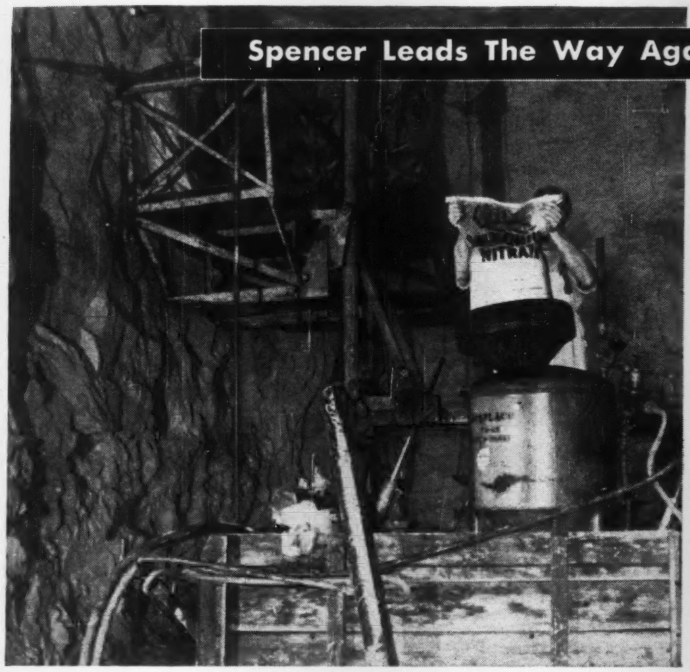
Here's how two contractors figured the fast schedule—A—*only the items that were priced differently in schedules B & A are shown*

1C—Utah Const. & Mining Co.

Bids: 5-2-61 Items	Unit	Quan-tity	Unit Prices 1B	1CA
Concrete	cy	200	$55.00	$56.00
Anchor rods	lf	1,300	2.75	2.80
Pipe culvert, 24"	lf	96	18.00	18.50
72"	lf	474	49.00	50.00
Riprap	sy	400	3.70	4.00
Excavation, rock, access tunnel	cy	86,000	11.80	12.00
exhaust tunnel	cy	22,000	18.50	19.00
Access to exhaust tunnel, north const	ls	job	31,500	32,000
south const	ls	job	17,500	18,000
Exhaust shafts, lined	lf	124	310.00	320.00
Bolts, supporting wire mesh reinf, 1st 3,700	ea	3,700	3.05	3.10
over 3,700	ea	6,000	3.05	3.10
rock, 6'-10' length, 1st 68,000 lf	lf	68,000	1.75	1.85
over 68,000 lf	lf	10,000	1.75	1.85
over 10' length	lf	1,700	1.80	1.90
spot rock, 6'-10' length	lf	2,500	2.20	2.30
over 10' length	lf	250	2.20	2.30
Bolts supporting chain link fabric	ea	400	3.15	3.25
Panning, sheet steel	lb	3,000	1.05	1.25
steel pipes	lf	450	6.60	7.00

(Continued on page 134)

Spencer Leads The Way Again . . .



A two-man team makes short work of filling blast holes with a Spencer Powder Monkey pneumatic machine and Spencer N-IV Ammonium Nitrate and fuel oil mixture. This is the fastest, most economical loading method known.

No tamping required! Spencer N-IV and fuel oil compound loaded with a pneumatic machine completely fills the holes to the proper density for maximum blast efficiency.

Now Spencer N-IV Goes Underground . . . Cuts Explosive Costs 40% to 50%

Leading the way to lower costs in underground blasting, Spencer's technical experts began more than three years ago to pioneer the use of Spencer N-IV Ammonium Nitrate and fuel oil mixtures in sub-surface mines. Today, Spencer N-IV is being successfully used in many underground mining operations.

The successful application of an ammonium nitrate and fuel oil mixture in underground blasting depends on:

a. A special grade ammonium nitrate such as Spencer N-IV.

b. The technical service experience of Spencer personnel who have handled millions of pounds of N-IV in underground mining.

Spencer N-IV should be used only in underground blasting applications such as limestone, salt, potash, granite, iron ore, gypsum, copper and uranium. This ammonium nitrate and fuel oil blasting agent is in no way to be construed as a permissible and is not to be used in underground coal mining.

Here are some of the important advantages of using Spencer N-IV Ammonium Nitrate and fuel oil in underground mining:

1. **Explosive costs are reduced 40% to 50%** when Spencer N-IV and fuel oil mixture is used instead of dynamite. Compared on a pound for pound basis with dynamite, Spencer N-IV produces at least equivalent performance, yet the per pound price of Spencer N-IV is far less.

2. **Drilling costs are lowered** because Spencer N-IV provides reliable blasting in small diameter holes where formerly dynamite was required. The uniform, round prills of Spencer N-IV flow freely to permit ideal loading density in holes as small as 1⅜ inches in diameter.

3. **Faster, more economical loading** is achieved by using Spencer N-IV to fill horizontal blast holes with a pneumatic loading machine — such as the Spencer Powder Monkey. For example, where this advanced loading method is being used, operators report that more than 250 holes can be filled and blasted in a regular eight-hour shift. More than 40 Spencer Powder Monkeys are presently in operation in underground mines.

4. **Fragmentation is excellent** — using Spencer N-IV for underground blasting, experience indicates that fragmentation results are equal or superior to those produced by dynamite.

For up-to-date information on lowering your underground blasting costs with Spencer N-IV Ammonium Nitrate and fuel oil mixtures, just return the coupon below.

SPENCER®

Spencer Chemical Company
407 Dwight Bldg.
Kansas City 5, Missouri

Please rush me the latest information on cutting underground blasting costs with Spencer N-IV and fuel oil mixtures.

Name______________________________

Firm______________________________

Address____________________________

City__________________ State__________

CIRCLE 133 ON READER SERVICE CARD

New and Improved

SAXE

SEATS & CLIPS

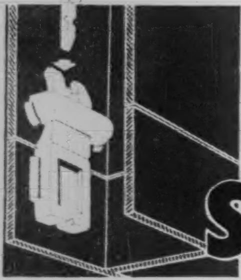
GUARANTEE THE MOST
ECONOMICAL
CONSTRUCTION

ASSURE EASIER
SPEEDIER · SAFER
STEEL ERECTION

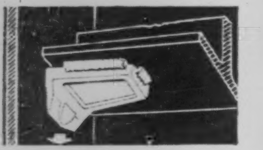
REDUCE SHOP COSTS

NO HOLES
NO PUNCHING
NO TEMPORARY BOLTS

SAVE
YOUR CLIENTS
TIME · MONEY
STEEL

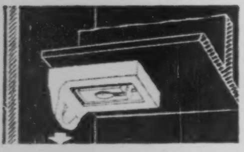


C-1 Clip . . . For Steel Column or Pile. Splice.

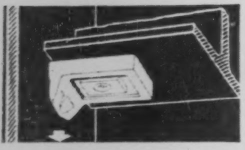


K-3 Clip . . . Fixed Position Manual Adjustment.

E-3 Seats. . . . fit all clips



K-3A Clip . . . Automatic Adjustment, 2 Directions. Horizontally.



K-3B Clip . . . Automatic Adjustment, 4 Directions. Horizontally.

Write for your free copy of The Saxe Manual for Structural Welding Practice, as applied to Saxe Seats & Clips for Welded Assembly.

SAXE
MANUAL FOR
STRUCTURAL
SUSTAINING MEMBER
AMERICAN WELDING SOCIETY

SAXE WELDED CONNECTIONS
1701 ST. PAUL ST. • BALTIMORE 2, MD.

Address European inquiries to King Aircraft Corp.,
Cameron St., Hillington, S.W. Glasgow 2, Scotland

CIRCLE 134 ON READER SERVICE CARD

. . . NORAD excavation

Bids: 5-2-61 Items	Unit	Quantity	Unit Prices 1C	2
Connections for grouting, 1st 50	ea	50	115.00	120.00
over 50	ea	100	115.00	120.00
Tunnel, exploratory, pilot, add cost	ls	job	9,000	9,500
Bolts, rock, roof, 6in'–10' length	lf	60,000	1.80	1.90
in walls, 6'–10' length	lf	22,000	1.00	1.05
over 10' length	lf	1,300	1.00	1.05
spot rock, 6'–10' length	lf	2,000	1.30	1.35
over 10' length	lf	250	1.30	1.40
Bolts, supporting chain link fabric, on roof	ea	2,000	3.75	4.00
mobilization & demobilization	ls	job	2,500	3,000
on walls	ea	1,200	3.75	4.00
Entrances, utility 8" hole	lf	1,500	96.00	98.00
Culvert, replace	ls	job	700.00	800.00
Accommodations for gov't inspectors	ls	job	16,500	18,000
Seepage water, care & handling, pumping water	Mgal	1,000	0.85	1.00

2—Frazier-Davis Const. Co. and Hunkin-Conkey Const. Co.

Bids: 5-2-61 Items	Unit	Quantity	Unit Prices B	A
Excavation, rock, access tunnel	cy	86,000	13.00	14.00
exhaust tunnel	cy	22,000	18.00	20.00
Excavation, rock, chmbrs excl of reservoirs	cy	175,000	8.00	8.50
for reservoirs	cy	27,000	10.00	10.50

ENR Construction Cost Index (1913=100) 20-cities average —847.32

Nebraska Sand & Silt Removal Costs $0.44 a Yd.

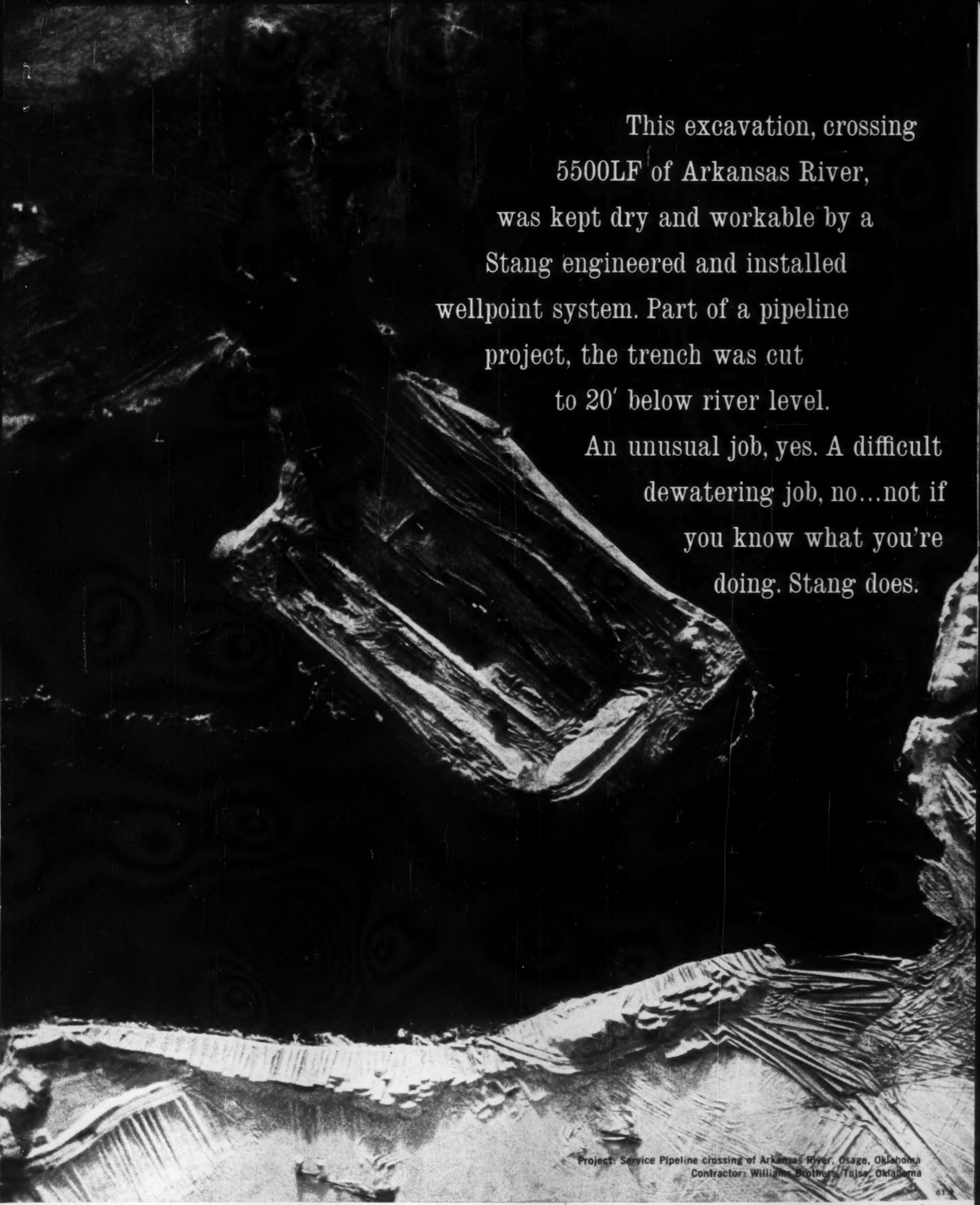
Since the work area for this $148,280 job to remove sand and silt deposits from three old channels of the Missouri River at DeSoto National Wildlife Refuge is completely cut off, by earthern dikes, from the river's new channel, the government will supply portable dredges to the contractor. Pentzien, Inc., Omaha, was low with a unit bid of $0.44 a yard for channel excavation. Second low, Christensen Sand & Gravel, Fremont, Neb., was out by 23% with a bid of $0.54 a yard, and the high by 25% at $0.55 a yard.

Work consists of removing sand and silt from three separate areas or channels with variable depths. The areas are as follows:

Area		Length	Slope	Bottom-Width	Max Depth
Area	A	4,000 ft	3:1	200 ft	9 ft
	B	5,000	3:1	500	4
	C	1,200	2:1	20	9

So far as the capacity of inlet and outlet water control structures and outside river deviation will permit, the government will cooperate with the contractor in the regulation of water levels within the work area. The contractor has to make his own assumptions as to anticipated water levels in the river during the construction period. He has 360 calendar days completion time. If not finished, liquidated damages will be $135.00 a calendar day.

Wage rates include: skilled labor, $2.85/hr; semi-skilled, $2.10; and common, $1.50.



This excavation, crossing 5500LF of Arkansas River, was kept dry and workable by a Stang engineered and installed wellpoint system. Part of a pipeline project, the trench was cut to 20′ below river level.

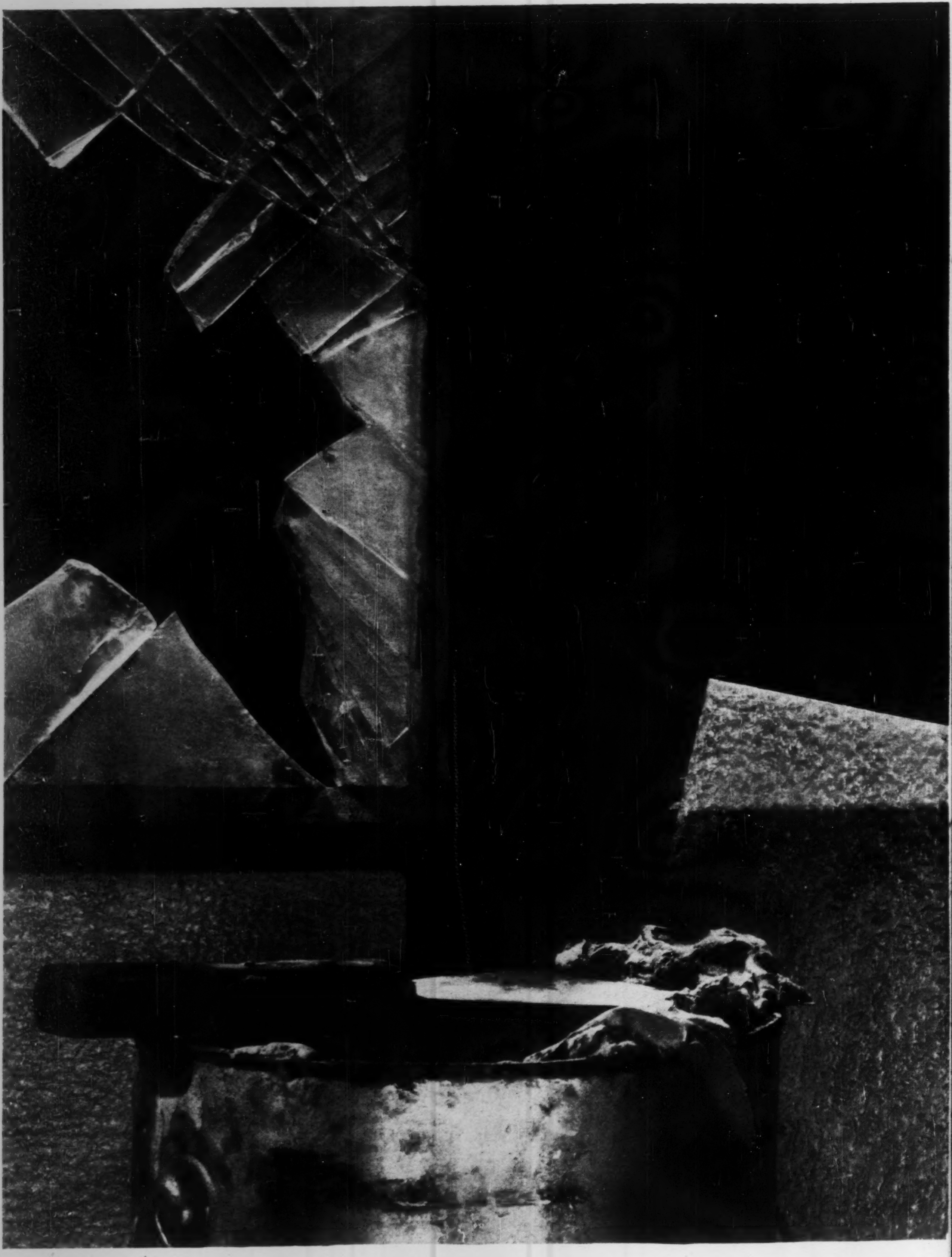
An unusual job, yes. A difficult dewatering job, no…not if you know what you're doing. Stang does.

Project: Service Pipeline crossing of Arkansas River, Osage, Oklahoma
Contractor: Williams Brothers, Tulsa, Oklahoma

Write for the new Stang General Catalog

JOHN W. **STANG** CORPORATION • 8221 Atlantic Avenue • Bell, California • Tacoma • Minneapolis • Omaha • Tulsa • Mobile • St. Petersburg
Engineers and Manufacturers of Dewatering Equipment, Wellpoint and Pumping Systems • Dewatering Planning • Equipment • Service

CIRCLE 135 ON READER SERVICE CARD



ALSYNITE FLAT PANES END BREAKAGE!

Eliminate costly replacement, cut maintenance costs 30% to 60%. Reinforced with millions of glass fibers, translucent Alsynite is shatterproof, needs no painting, transmits only glare-free diffused light. Daylight your industrial buildings the modern way with premium quality Alsynite, backed by the international reputation of RCI. Glaze with Alsynite Flat Panes—in 5 colors and in sizes to fit all standard sash. Your first replacement cost with Alsynite is your last!

ALSYNITE®
TRANSLUCENT PANELS
A DIVISION OF REICHHOLD CHEMICALS, INC.

Talk over your requirements with your Alsynite Dealer, listed in the Yellow Pages under plastic products or clip out this page and mail to:

ALSYNITE DIVISION OF
REICHHOLD CHEMICALS, INC.
San Diego 9, California

Please send me free literature on Alsynite flat panes for industrial glazing.

Name______________________________

Firm______________________________

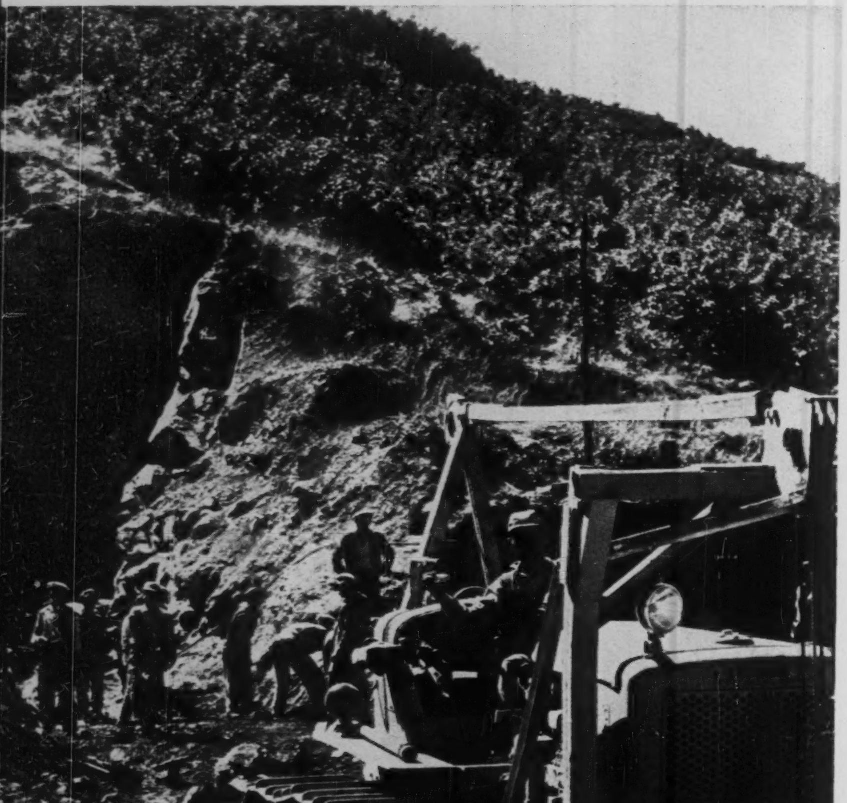
Address____________________________

City______________ Zone___ State______

Attn. DEPT. ENR-661

International

Machines in Turkey and Men in



In Turkey, modern equipment scoops out the roadbed.

By Lt. William D. Middleton

Construction crews pushing westward from Iran and eastward from Turkey are forging a direct rail link between the two countries.

When work on current projects is finished next year, only 189 miles will separate the two national railroad systems. That includes a 56-mile ferry route across Lake Van (see map). Current planning, although somewhat uncertain, calls for driving the final spike in the line in the rugged Khotur mountains within four or five years.

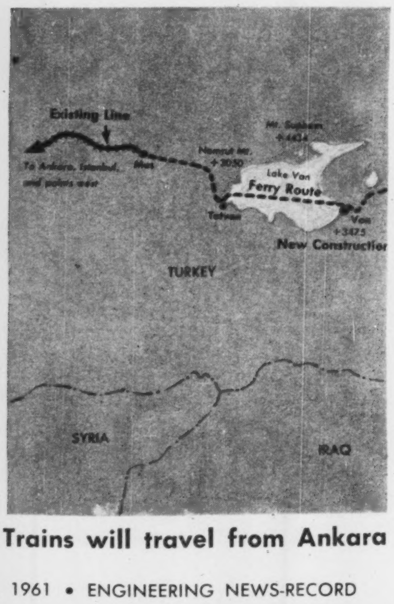
In Turkey, the contractor is working on 61 miles of track that will extend the eastern end of the Turkish State Railways line from Mus to Tatvan, on the western shore of Lake Van. Work on this section—including four tunnels—is being done with modern heavy equipment.

In Iran, work is progressing on 25 miles of track from Sharifkhaneh toward the border. Here, hand labor is predominant.

Completion of the line will provide a direct rail connection between western Europe and Teheran, plus a new and more favorable rail-water route via the Turkish Mediterranean port of Isken-

---

__Lieutenant Middleton,__ of the U. S. Navy's Civil Engineer Corps, lives at Golcuk, Turkey, where he is civil engineering advisor to the Turkish navy on the staff of the Joint U. S. Military Mission for Aid to Turkey.



Trains will travel from Ankara

Iran Push a Long-Sought Rail Link

derun. Freight now travels a circuitous route through the Suez Canal, the Red Sea and the Arabian Sea to the Persian Gulf port of Khorranshar. For some areas of Iran, six months shipping time will be reduced to three weeks.

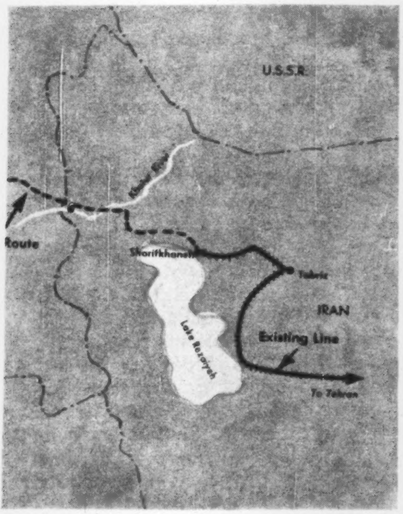
Ultimately, when other projected construction in Iran is completed, this stretch of rail will form part of an unbroken railroad route from Western Europe to Pakistan and India.

Engineers made location surveys for the rail connection as early as 1935. In 1958, the Chicago consulting firm of DeLeuw, Cather & Co. completed an engineering and economic study of the entire route for the International Cooperation Administration.

Prime force behind completion of the railroad is the Central Treaty Organization (CENTO), successor to the Baghdad Pact group. CENTO is made up of Turkey, Iran, Pakistan and the United Kingdom, with the U. S. as an associate member.

In 1955 Turkey completed 65 miles of new line from Genc to Mus. During 1957 and 1958 Iran opened 189 miles of new standard gage track between Mianeh and Tabriz to connect the remainder of the nationalized system and Teheran with a previously isolated broad gage railroad in Azerbaijan Province. Since then, Iran has converted 52 miles of broad gage line between Tabriz and Sharifkaneh to standard gage.

(*Please turn the page*)



to Teheran on planned line.

In Iran, two men plus a block of wood compact the roadbed.

Tunnels on the route are lined with stone masonry.

• Design and location—Location and design standards are a compromise between the economics of train operation and the difficult construction conditions encountered in the rugged mountains of eastern Turkey and western Iran.

Generally, the DeLeuw, Cather report recommended a maximum grade of 1.5% compensated for curvature and reduced to two-thirds of the maximum in tunnels. They also recommended a maximum curvature of about 5 deg 45 min; final designs by the Turkish Ministry of Public Works provide for a maximum of about 2 deg 56 min., except for approaches to stations, where maximum is about 4 deg 23 min.

The line incorporates crushed stone ballast to a depth of 18 in., hardwood crossties and rail weighing 93.5 lb per yd. Roadbed width is 20 ft on fill and 27 ft in cut; right-of-way width is 72 ft, except where additional space is required for stations, cut and fill slopes, and so on.

Bridges and culverts are being built of stone masonry and reinforced concrete wherever possible, to utilize locally available materials and skills. Tunnel linings are stone masonry.

• Turkish sections—Elevations along the 61-mile Mus-Tatvan line range from 4,221 ft to 5,900 ft. There are four tunnels totaling 7,300 ft in length; the longest is 3,608 ft. Turkish engineers estimate 4.6 million cu yd of excavation to be necessary. Largest bridge on this section is a steel structure 105 ft long.

Engineers chose the 56-mile Tatvan-Van ferry crossing of Lake Van because of the prohibitive cost of a railroad route around either the northern or southern end of the lake. A south shore route was estimated to cost more than $91 million; a north shore route, more than $70 million. Total estimated cost of the ferry route, including two 1,000-ton capacity ferries, terminal facilities and a drydock is about $17.5 million.

Beginning at an elevation of 5,412 ft at Lake Van, the 74-mile line to the border will reach an elevation of 7,183 ft before descending into the Khotur River canyon. The Turkish Ministry of Public Works plans six tunnels (total length, 6,673 ft) for this portion of the route and estimates some 4.1 million cu yd of excavation will be needed.

• Iranian sections—The 84 miles of new line from the Iranian border to Sharifkhaneh will contain some of the most difficult construction of the entire project. The preliminary alignment and profile required a total of 27 tunnels with an aggregate length of 16,416 ft.

In the roughest part of the Khotur canyon, maintenance of the 1.5% grade established for the remainder of the route would have created prohibitive construction costs. DeLeuw, Cather engineers recommended 8.7 miles of 2.8% grade for westbound traffic, which will require a pusher locomotive.

Iranian engineers are making additional surveys of the most rugged sections, with a view toward reducing the number and length of tunnels and establishing a more uniform grade.

• Construction methods—Construction in the two countries offers marked contrasts in equipment and methods. In Turkey, excavation, grading and tunneling are highly mechanized. The contractor—Garanti Insaat Limited Sirketi—during the 1960 March-November construction season used from 60 to 80 pieces of equipment and as many as 3,500 men to advance the work on a 22-hour-per-day schedule.

Contract price on this section is about $11 million. Work began in 1959 and is scheduled for completion in August, 1962.

In Iran, only a very limited quantity of heavy equipment is in use. Excavation, placement and compaction of fills are done largely by hand labor. More than 800 men are at work on the line. Crews are not installing rails, since there will be no traffic over the new section until the line reaches a terminal.

• Financing—The DeLeuw, Cather 1958 report estimated a total cost of the line between Tabriz and Mus of nearly $130 million, divided about equally between Turkish or Iranian currencies and "hard currency" foreign exchange needed to purchase construction equipment, rails and other materials.

Current cost estimates for the remaining work, however, are somewhat lower. Estimate for the 74-mile line between Van and the Iranian border is about $20 million, or $270,000 per mile.

Most of the foreign aid for the project has come thus far from the U. S. In 1957, $2.1 million was advanced for surveys, engineering and construction supervision in Iran. In December, 1960, another $6 million was made available through the Development Loan Fund to buy rails and other materials for the Mus-Tatvan line in Turkey. Great Britain has contributed a token amount, largely in the form of heavy dump trucks.

Local currency allocations to the project by Turkey and Iran have about doubled the hard currency credits advanced by the U. S. and Great Britain.

Principal obstacle to completion of the missing links in the line is the need for foreign exchange. Some officials in the U. S. and Britain have become skeptical about the economic feasibility of the project. To date, neither country has committed itself to any further aid.

Now one product cures, hardens, seals and dustproofs wet concrete floors with a single application

West Chemical Concrete Floor Treatment goes right on after troweling... cuts labor costs in half

Now you can treat newly-laid concrete floors immediately after troweling with no delays for drying. No delays between treatment applications.

For West Concrete Floor Treatment cures, hardens, seals and dustproofs wet concrete with a single, simple, penetrating application. Gives a thorough, deep-cure treatment which also prepares the surface perfectly for the addition of composition tile or other material.

It enables concrete to retain over 95% of its moisture. Permits a gradual and even release of moisture so that the curing, hardening and sealing processes occur simultaneously.

Just one coat of West Concrete Floor Treatment seals concrete against stains from acids, oils, and greases during the early construction phases. Protects surface from plaster, paint, mud, and abrasive traffic during final construction phases.

This remarkable time-and-labor saving treatment is as effective indoors as out. No special skill is needed to apply it. No complicated machinery or equipment. And it meets ASTM specifications C-156 and C-309.

So speed up your whole operation, cut costs in half and protect your investment by proper curing with West Concrete Floor Treatment.

The man to contact for specifications and additional information is your local West representative, or mail coupon below. West Chemical Products, Inc., 42-16 West Street, Long Island City 1, N. Y. In Canada: West Chemical Products, Ltd., 5621-23 Casgrain Ave., Montreal, P. Q.

WEST CHEMICAL PRODUCTS INC.

FLOOR PRODUCTS DIVISION

West Chemical Products, Inc.
Floor Products Division, Dept. NB1
42-16 West Street, Long Island City 1, New York

☐ Please send me further information on West Concrete Floor Treatment

☐ Have your representative call

Name____________________

Company____________________

Address____________________

City__________ Zone_____ State______

CIRCLE 141 ON READER SERVICE CARD

A contractor from Arizona reports:

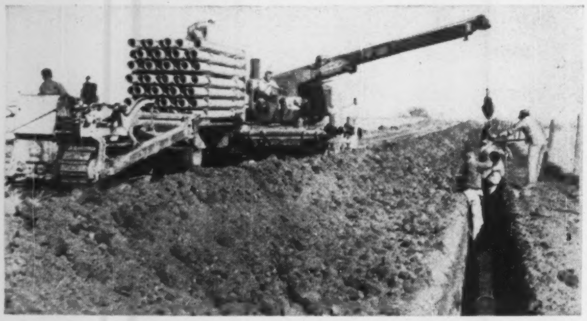
“In only 8 hours, we installed 7,100 feet of Transite Water Pipe.”

Jay Baldwin, Supervisor,
E. P. Hunziker Construction Company, Tucson, Arizona

“We achieved the phenomenal installation rate of up to 947 feet in one hour on a 12-mile Transite Water Pipe job for the Oracle Village Water Company. Since the job called for stringing out the pipe, excavating, fine grading the trench bottom, installing, testing and backfilling, it took a well-planned operation and excellent teamwork by everyone concerned to get this rapid installation. Of course, a very large part of the credit has to go to Transite Pipe itself. Its long lengths, light weight and speedy coupling methods got the job done quickly, with a minimum of effort and with virtually no manual handling of the pipe.

“After completing each 1000 feet, we tested the line. The result? Not one leak in the entire 12 miles. I'm convinced that for fast, sure results, you can't beat Transite Pipe.”

For the full Hunziker and Transite® story, write Johns-Manville, Box 14, EN-6, N. Y. 16, N. Y. In Canada: Port Credit, Ontario. Cable: Johnmanvil.



JOHNS-MANVILLE
TRANSITE PIPE
THE WHITE PIPE THAT PROTECTS PRICELESS WATER

JOHNS-MANVILLE JM PRODUCTS

Letter from Moscow

Why Construction Worries the Soviets

By Ernest Conine

Not long ago the Soviet press exposed—with some horror—an enterprising engineer who had acquired two tower cranes and gone into business for himself building private housing.

In Saratov province, there was another case where collective farms procured timber from "private traders" and hired workers through unofficial channels to build livestock barns.

In the virgin lands far to the east, "construction nomads" show up each year to build for state and collective farms. These "private" enterprisers demand double the normal wages—and sometimes their airplane fare—but find plenty of takers because they get the job done.

All this doesn't mean private enterprise is on its way back in the Soviet Union. It's four decades too late for that, and the authorities act quickly against cases like those above.

But these incidents do throw light on the tightness of the construction picture in Russia, and on the results of the distorted incentives under which the nation's official building industry works.

For, almost lost amidst the chorus of self-congratulation on its impressive industrial progress, there is an increasing note of worry in the Soviet Union about one of the most vital sectors in the country's economy: capital construction.

Few areas of activity are endowed with more Kremlin-blessed glamour than the construction industry.

Mushrooming housing projects are among the first things shown to foreign visitors to Moscow. In Soviet literature and drama, the young Communist who goes off to help build a dam in lonely, frigid Siberia is a heroic model for Soviet youth.

In the barrage of publicity about the Soviet building effort, however, it is easy to overlook the fact that the construction industry failed to meet its goals for the last two years, and latest reports indicate it is falling short in 1961.

Construction of thermal power stations is admittedly behind schedule. The projected chemical combine in Siberia is lagging. On-time completion of the metallurgical center at Karaganda is threatened.

So far, alarm in official circles is being expressed in low key—indicating responsible authorities are confident the situation isn't yet out of hand. However, several steps reflect growing concern:

- Kremlin leaders, complaining that cement production is failing to keep up with demand, have decreed that output be stepped up and new mills built quickly.
- The more than 1,000 industrial plants which produce goods for the construction industry are being ordered anew to make on-time deliveries.
- The state is moving to prevent diversion of scarce materials and manpower to unauthorized projects—some of them built by "private" organizations which have emerged occasionally.
- Perhaps most important, planning circles are tinkering with the incentive system, which has often worked more to encourage scattering of valuable resources than on-time completion of key projects.

To keep matters in perspective, it is important to keep in mind the scope of the Soviet construction effort.

During the Seven Year Plan which ends with 1965, more than 7,000 "major" industrial establishments are to be put into operation. Some 12,400 miles of railway track will be laid. The nation's power-producing capacity will be doubled. And 15 million apartments concurrently are being built for the populace.

For 1959 and 1960, capital investments totaled 49-billion rubles (at the official exchange rate, one ruble is worth $1.11). The tempo increases this year with capital investments scheduled to reach 29.4-billion rubles.

Construction represents roughly three-fourths of capital investment. And of this total construction effort, only a third is accounted for by the much publicized housing program. The rest goes to build Russian industrial might.

There is no doubt this massive dose of capital is, for the most part, being successfully absorbed.

The Soviets claim that more than 1,000 new industrial enterprises went into operation last year. The score includes commissioning of four blast furnaces, six rolling mills, power stations with capacities totaling 6-million kw, and 2,900 miles of natural gas pipelines.

The plan for 1961 is ambitious, too.

A priority list of 434 projects—to get first call on money, men and materials—has been drawn up. It includes, for example, 71 chemical plants, 47 power stations, 26 oil and gas installations and 38 ferrous metallurgy plants.

Construction starts this year on the Nurek Hydroelectric Station in Tadjikistan. Boasting a dam almost 1,000 ft high, it will upon completion irrigate almost 7.5-million acres and produce the Soviet Union's cheapest electricity. Elsewhere, three big thermal stations with capacities of 2.4-million each will start taking shape.

Soviet planners become almost lyrical when they discuss the superiority of their centralized planning system for meeting their ambitious construction goals.

Pointing to the economies of mass production, they talk of standardized designs making it possible to construct buildings for any purpose, anywhere in the Communist world, from standardized components.

Use of factory-produced concrete components will transform "construction sites into assembly sites," they like to say.

Further, the state-imposed priority system supposedly avoids dissipation of vital resources on "unimportant projects."

However, the Soviets are finding that things don't always work out according to plan. Rather large cracks began to appear in the Russian program almost a year ago.

(Please turn the page)

Correspondent Conine, in Moscow since 1959, formerly served ENR in Washington. This was one of his first major assignments after the lifting of news censorship by the Soviets.

- A conference was called in Moscow last spring to discuss means of solving a cement shortage.
- The July plenum of the Party's Central Committee was told of lagging construction in the machine tool field; of 77 projects checked, construction had been under way on 14 for more than ten years, and on 39 others for five to ten years.
- The Ministry of Power Station Construction came under intermittent fire in the government-controlled press for slow work on thermal stations.
- Then, at the Supreme Soviet session that convened in December, planning and construction officials were subjected to criticism by speaker after speaker.

Early this year, the Central Statistical Administration made it official by reporting that construction in 1960 fell one per cent short of the goal. The report complained of "substantial shortcomings" in construction.

At first blush, 99% fulfillment doesn't seem like a bad score. However, available information shows high officials are indeed concerned.

The situation may be getting worse. Ivan Grishmanov, Chairman of the State Construction Committee, says "serious worry should arise from results of the first two months of 1961." He notes the January construction performance fell 11% short of the target, and production for February was underfulfilled.

Worse, plan "fulfillment" doesn't necessarily spell completed structures ready for occupancy. The amount of unfinished construction is growing—"an alarming development," as one Soviet newspaper put it.

Several factors obviously enter into the construction failings:

Material shortages—Building organizations complain of a lag in production of building materials, and late deliveries. At a Ukrainian automobile plant, for example, tardy delivery of reinforced concrete structurals and roofing materials delayed completion of construction—and initiation of production.

Designs—Design organizations are charged with late delivery of prints. Example: Builders are reported marking time on a huge new blast furnace 250 miles southeast of Moscow because—three months after the foundation was laid—70% of the technical documentation is missing.

Also, designers are accused of failing to take advantage of opportunities for standardization. At the projected Bratsk wood-chemical complex, the plant design features 19 different spans—some differing only a few inches—and six variations of column spacings.

Labor—Labor turnover is a serious problem, particularly for projects in Siberia and the Far East where the weather is severe, housing is often primitive and entertainment facilities scarce.

IZVESTIA recently complained that trains carry workers away from Bratsk every day at a time when the big hydro project "urgently requires 10,000 additional workers . . . labor turnover inflicts great harm." At one project in Perm, 525 out of 620 workers left the job last year.

Low quality—The Soviet press recently reported that one wing of a building under construction in Kharkov collapsed because the constructors neglected to install rain drainage pipes. Water seeping into the walls froze; with the thaw came the collapse. At Temir-Tau, a half million rubles worth of building materials were wasted on work of such low quality it had to be done over.

Equipment — Construction equipment often is delivered late, or with key components missing. But top officials say inadequate use of equipment is more to blame.

They say the construction organizations have 38,000 excavators and an equal number of bulldozers. But due partly to worker idleness growing out of materials scarcities, such equipment often is used to only one-fourth capacity.

Scattering of resources—Most of all, though, the Kremlin planners complain repeatedly about "pulverization" of resources—in other words, they have difficulty concentrating construction effort where they want it. The tendency is to start a project, then abandon or neglect it while work begins on a still newer project.

PRAVDA complained recently that, when the Tatar Economic Council appropriated 371-million rubles for work on 800 new projects last year, it knew "perfectly well that it was short more than 150-million rubles for projects already under construction."

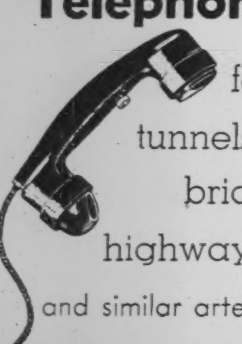
The drawing up of a "priority" list of 434 projects obviously is an attempt to concentrate effort where the central planners want it. But in 1960, when such a list also was in existence, more than 1-billion rubles were spent in the Russian republic alone on "unauthorized" projects.

The result of all this, of course, is long, dragged-out periods of construction on a given job.

At Karaganda, a thermal power sta-

(*International continued p. 146*)

Sound Powered Telephones



for tunnels bridges highways and similar arteries

Help to keep traffic rolling . . . to ease tie-ups . . . to report changing conditions.

NEED NO CURRENT

These phones provide positive communication at all times without the use of batteries or other outside sources of current. Operate with unusual clarity over a distance of many miles. In outdoor or indoor models — in standard systems or those altered to your specifications.

Send for illustrated catalog

HOSE-McCANN
TELEPHONE CO., INC.
761 THIRD AVE. BROOKLYN 32, N. Y.

WORTHINGTON COMPRESSOR NEWS:

PORTABLE COMPRESSOR COMPETITIVE ANALYSIS CHART

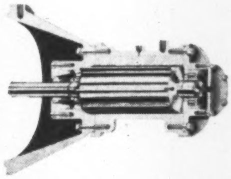
FEATURE OR BENEFIT	MONO-ROTOR	TWO-STAGE	SCREW-TYPE
DESIGN PROVEN IN CONSTRUCTION INDUSTRY	YES	YES	NO
ONE STAGE	YES	NO	YES
SINGLE ROTOR	YES	NO	NO
MAIN BEARINGS	2	4	4
TIMING GEARS	NO	SOME	YES
OIL SEALING	YES	YES	YES
SIMPLE CYLINDER SHAPE	YES	YES	NO
OIL PUMP NEEDED	NO	YES	YES
CRITICAL ALIGNMENT OF ROTORS	NO	NO	YES
TOTAL WEIGHT	LEAST	MORE	MORE
AVAILABILITY	NOW	NOW	?
CLUTCH	YES	SOME	NO
FEWEST PARTS	LEAST	MOST	MORE
MAXIMUM AMBIENT TEMPERATURES	125°	125°	115°
WARRANTY PERIOD	1 YEAR	*90 DAYS	*90 DAYS
FIELD PROVEN	YES	YES	NO

*(USUAL)

ANALYSIS PROVES THAT NEW MONO-ROTOR HAS BEST DESIGN

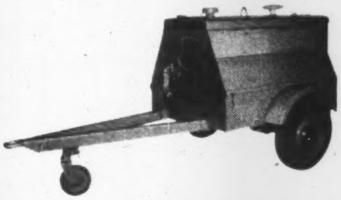
The easiest way to evaluate the compressor designs available today is to draw your own comparison chart. Above is one such chart covering many valid points of comparison between three compressor designs available—the screw type, the two-stage rotary and the new Worthington Mono-Rotor Blue Brute compressor. It clearly shows the new Mono-Rotor's superiority.

The new Worthington Mono-Rotor compressor is built with just one stage . . . just one rotor . . . just two bearings . . . no gears and no oil pump. It is obviously less complex than either of the other designs.



THE MONO-ROTOR HAS 1 ROTOR...
2 BEARINGS...NO GEARS...NO OIL PUMP

What proof of dependability is there for the Mono-Rotor? Over the last three years, this new compressor has been given what is probably the most thorough field testing ever given any compressor introduced to the construction industry. Tests have been so satisfactory that Worthington has extended the Warranty of these units to one full year from the usual 90-day period.



NEW 125' MONO-ROTOR COMPRESSOR

One of the most important points of comparison is the high temperature capability. The Mono-Rotor performs satisfactorily in the up to 125°F temperatures encountered in many domestic and foreign regions.

Note, too, that Worthington retains the clutch in the Mono-Rotor. Not necessary in daily operation, it still is helpful for very cold weather starting—and a real convenience in engine servicing.

Not noted in the chart is the fact that the new Worthington Mono-Rotors are 20% lighter in weight and are designed for improved towing and tracking. The third wheel is standard. It runs all day on one tank of fuel and has other features, too.

The Mono-Rotor Blue Brute can now be ordered in the 85', 125' and 250' sizes. See it . . . rent it . . . or buy it at your Worthington dealer listed in the Yellow Pages under "Compressors". Or write Worthington Corporation, Dept. 60-38, Holyoke, Mass. In Canada, Worthington (Canada) Ltd., Brantford, Ontario.

WORTHINGTON

PRODUCTS THAT WORK FOR YOUR PROFIT

CIRCLE 145 ON READER SERVICE CARD

Now . . . NEW!

An "INDEX TO SPECS!" on asphalt and asphaltic products

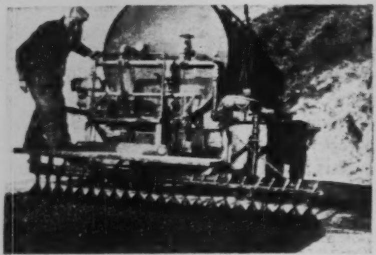
A condensed library of facts for ready reference whenever you need information on the use of asphalt, Bitumuls® (emulsified asphalt), or Laykold® specialty products.

Use the handy coupon, below, to order your copies of these index cards. No obligation, of course.

An index to available literature and data on BITUMULS and other products
A.I.A. FILE NO. 11-D
An index to available literature and data on LAYKOLD specialty products
A.I.A. FILE NO. 11-D
American Bitumuls & Asphalt Company

These index cards have been especially prepared for *your* files. They provide brief data and source-reference information on asphalts and emulsions.

ASPHALT for all types of paving and surfacing



BITUMULS for base mixes, and for surfacing and sealing of pavements—

LAYKOLD specialty products; tennis courts, playgrounds, mastic floors, etc.

American Bitumuls & Asphalt Company

320 Market St., San Francisco 20, Calif.

Perth Amboy, N.J. Baltimore 3, Md.
Cincinnati 38, Ohio St. Louis 17, Mo. Oakland 1, Calif.
Atlanta 8, Ga. Tucson, Ariz. Inglewood, Calif.
Mobile, Ala. Portland 8, Ore. San Juan 23, P. R.

American Bitumuls & Asphalt Co.
P. O. Box 3495, San Francisco, Calif.

Gentlemen: Please send me your new "Index to Specs," file card on:

☐ BITUMULS AND ASPHALTS
☐ LAYKOLD SPECIALTIES

Name..
Firm.......................... Title..............
Address......................................
City & State..................................

tion has been under construction for eight years and is still unfinished. In the Omsk region, a wool-processing factory has been in the building stage since 1954, but only one of 12 planned units has been commissioned.

Official Soviet statements make it clear these are not isolated cases.

According to Gosplan (the State Planning Committee), construction representing a 5-billion ruble investment was incomplete at the beginning of 1959. Up-to-date estimates are unavailable, but officials have complained that the volume of uncompleted projects is "growing."

A Soviet economist recently said flatly that "the State plan for capital works of the most important branches is not being fulfilled."

This causes some impatient customers to turn to the outlaw "private builders"—who, of course, feed their illicit enterprise with materials filched from legal projects or channels.

Construction men and Kremlin planners seem to agree that the main culprit is the distorted incentive system which encourages construction organizations to concentrate on the fast ruble at the expense of finishing the jobs they set out to do.

A Soviet newspaper exposé of construction lags at the projected chemical complex in Irkutsk notes that "in the main, the foundation and walls are erected—because this is profitable for fulfilling the plan in rubles. . . . It turns out that it is possible to fulfill the plan in money terms, and still not complete even one building."

For the most part, the Soviet's reaction to their construction problems is to apply the same solutions that have been approved in the past—only with more steam.

The propaganda machine is building up a mammoth drive for young Communist workers, who make up two-thirds of the construction labor force, to compete in finding and applying more efficient methods for performing their work.

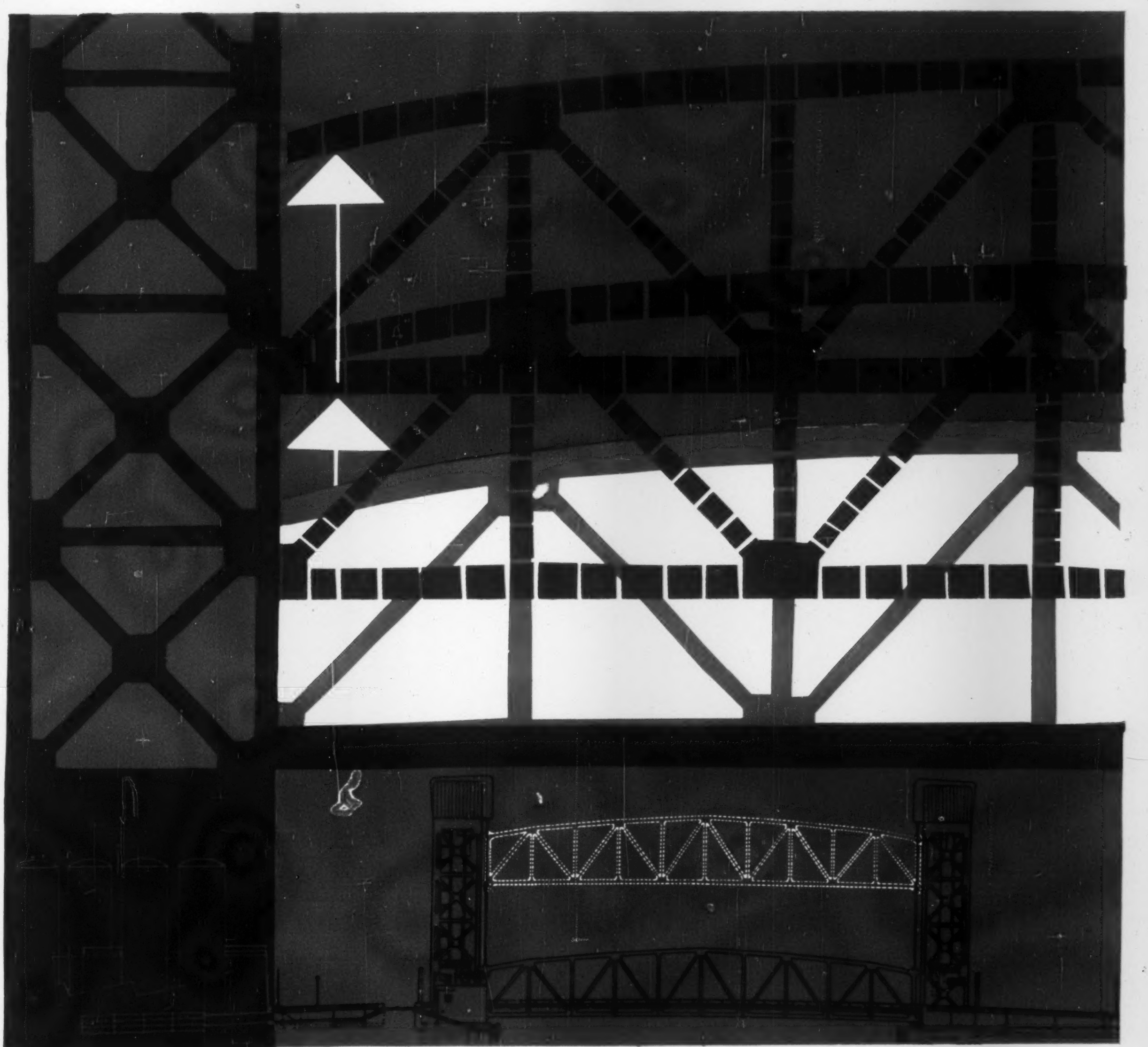
Recognizing that mass-assembly construction techniques call for increasing skilled labor, night schools and correspondence courses are being established to help the workers upgrade themselves.

The cement industry is raising its sights—current production of 45.5-million tons annually is to be doubled by 1965, thus making the Soviet Union the world's top producer.

Heavier penalties are being invoked for persons guilty of misappropriating building materials.

Probably the most far-reaching step

(*International continued p. 151*)



OHIO STREET LIFT BRIDGE, BUFFALO, NEW YORK

fabricated by

the LEVINSON STEEL COMPANY
Pittsburgh 3, Pa
Phone HUbbard 1 3200

Another FIRST from Esso Research...

ANNOUNCING TWO NEW COLORED PAVING MATERIALS

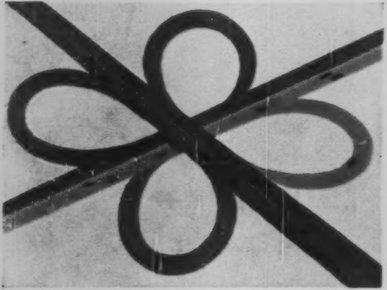
*Viadon**

for permanently colored pavements that open up new horizons in design!

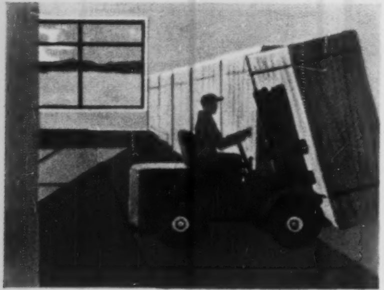
*Miradon**

for colored pavements requiring high resistance to fuels and oils!

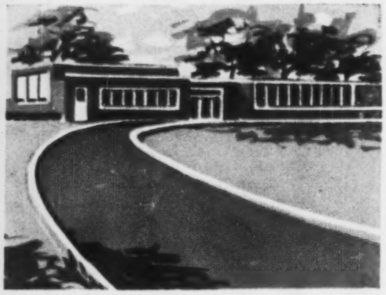
*TRADEMARK



PROMOTES HIGHWAY SAFETY: Can be used to set off speed zones, stop streets, crosswalks, safety islands, and turn-offs at cloverleafs.



INCREASES PLANT EFFICIENCY: Makes light-colored, high-strength flooring; distinguishes danger zones, exits, assembly areas, etc.

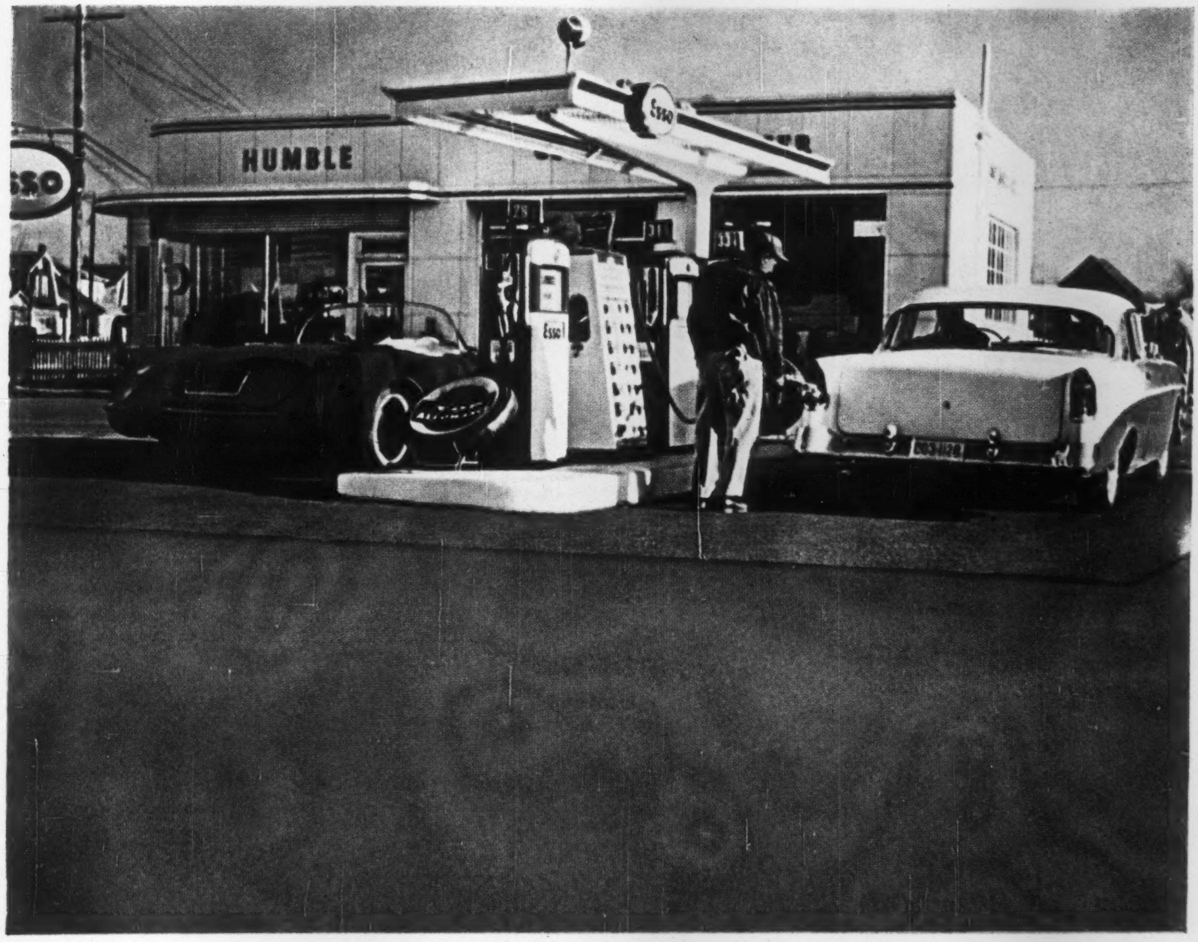


DECORATIVE: The modern trend to color creates a ready-made demand for driveways, carports, and patios paved in color.

Today, color is everywhere — serving all kinds of decorative and functional purposes. Why not on pavement, too... permanent color mixed into the pavement to stay in as long as the pavement lasts? Esso Research now announces the answers: VIADON and MIRADON!

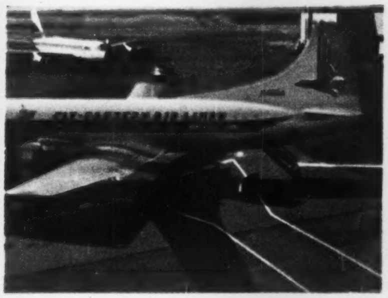
These remarkable new materials make colored pavement a practical reality. The color is built in. It cannot wear off. Either material can be mixed in a standard asphalt pugmill and both can be laid with existing construction equipment. Resulting surfaces are able to support heavy traffic on roads or runways.

Applications are almost limitless! Shopping centers, parking lots, driveways, playgrounds, tennis courts, patios, and pools can now be surfaced in pleasing



NOW! COLORED PAVING IN RED, GREEN, BLUE, YELLOW-GOLD AND WHITE!

STAYS WHITE WHEN WET: High-strength extruded curbing of Viadon or Miradon won't turn gray in rain like other materials.



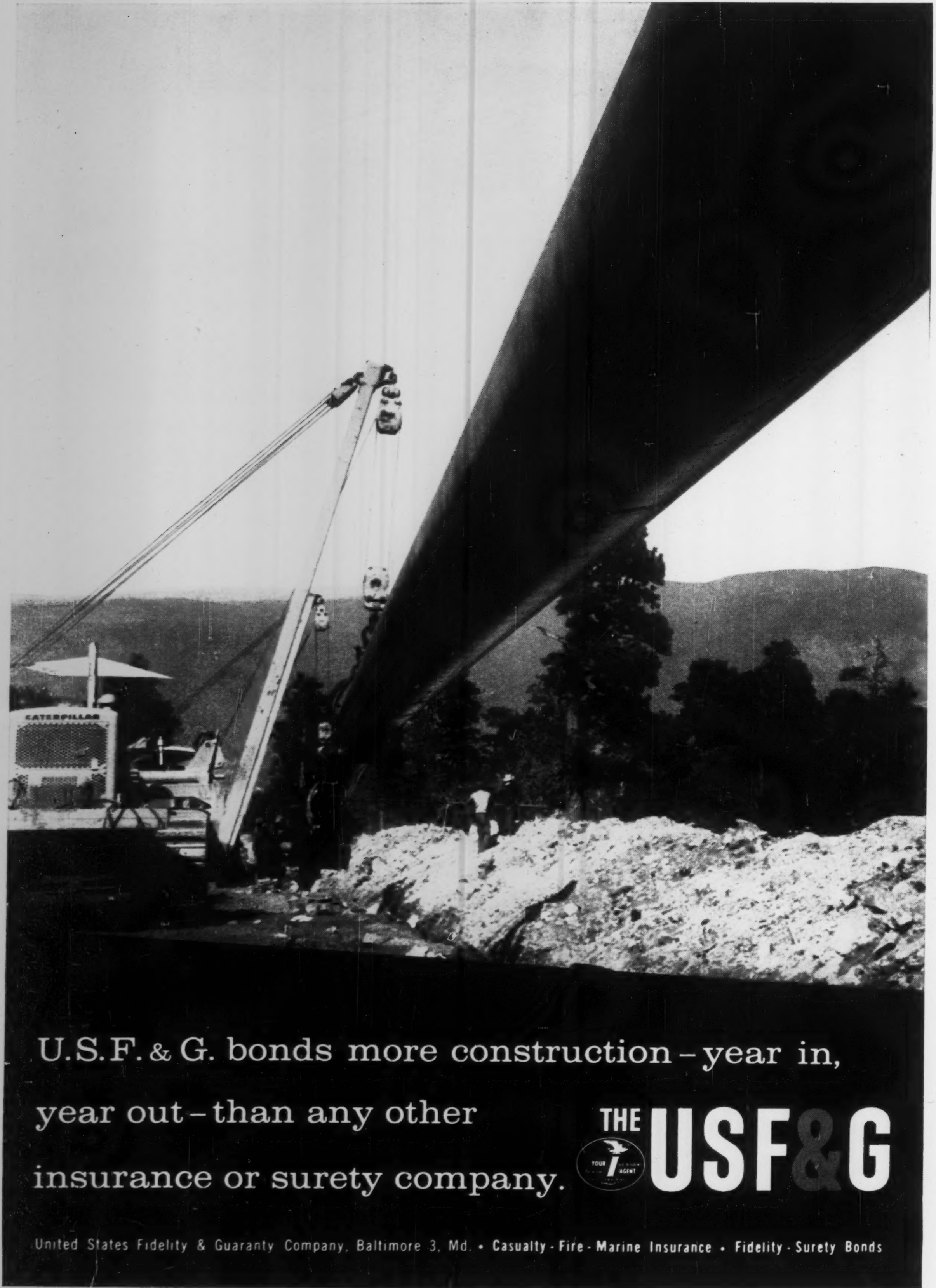
IDEAL FOR AIRPORTS: Unaffected by fuels and lubricants. Miradon colorfully identifies landing strips, aprons, and parking areas.

THERMOPLASTIC: Won't set permanently in transit; can be softened by heat if desired. No special storage facilities are needed.

colors to harmonize with their surroundings. For greater traffic safety, curbings, crosswalks, intersections, centerlines, etc., can be clearly and permanently indicated with Viadon or Miradon. For more information or technical assistance, write to us at 15 West 51st Street, New York 19, New York.

ESSO STANDARD, DIVISION OF
HUMBLE OIL & REFINING COMPANY

Esso


CATERPILLAR
U.S.F. & G. bonds more construction – year in, year out – than any other insurance or surety company.
THE USF&G
United States Fidelity & Guaranty Company, Baltimore 3, Md. • Casualty - Fire - Marine Insurance • Fidelity - Surety Bonds

is the one which began at year-end, details of which are still not avaliable. This is reform of the construction incentive system.

In the past, construction organizations—which are state-owned trusts operating generally under the regional economic councils—worked under contracts which provided that the "customer" would pay the builders every ten days for the volume of work completed in that period.

As one Soviet construction official has said, "the building organizations always experience great financial difficulties. They have no money to pay wages in time, to pay for supplies and services. They are forced to pay attention, first of all, to getting money from the customer for the current ten-day period. Hence the emphasis on expensive works which consume little labor.

"Receiving money for the completed elements of a project, they are not much interested in the concentration of resources on a limited number of projects. On the contrary, under the (old) system of financing, often suffering from shortages of materials, equipment and money, they must in order to exist start more and more new projects, actually helping to scatter the state investments."

Normally, the contract obligates the builder to finish a project within a certain period. But it hasn't required him to complete a certain volume of work on specific projects each year. And it hasn't placed on him the responsibility for meeting cost goals.

The Soviets indicate they are determined to change all this.

Gosplan Chief Vladimir Novikov says this year, for the first time, capital investments for projects are being spelled out "for the entire period of their construction in order to promote better adherence" to building schedules.

However, it isn't clear whether this means the contractors are being told they must finish assigned projects in a given period of time for x-number of rubles—or else.

The Council of Ministers is known to have ordered Gosplan, the Finance Ministry and the State Construction Committee to study proposals to give building contractor organizations their own working capital, with the customer holding back most of the payment until the job is finished.

Meanwhile, there's no good answer available to the question of just how serious the Soviet industrial construction problem is.

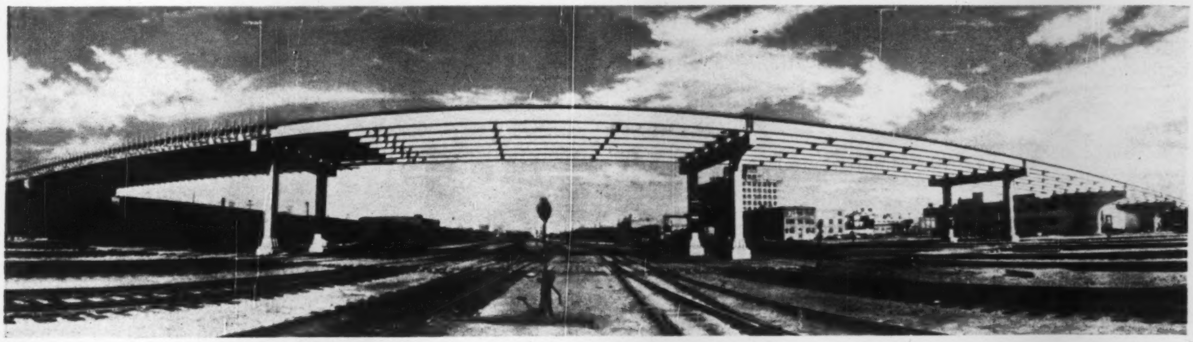
Official statements and Soviet press accounts are the chief sources of information—and they tend to paint a picture that is extremely bright or extremely dark, depending upon whether they're trying at the moment to impress the reader with the infallibility of the Communist system, or trying to shame the builders into a better performance.

On balance, it is clear that a problem exists—an increasingly worrisome one—but one that hasn't reached truly alarming proportions. Certainly the Soviets' success thus far in meeting most key industrial production goals seems to confirm this judgment.

The outsider must keep in mind that the Soviet forced-draft economic system, designed as it is to operate at full capacity, is supposed to develop a certain number of creaking joints. It's part of the game.

Clearly, though, the situation will bear watching.

Most of the oft-advertised effort to overtake the U.S. in industrial production still lies ahead. It will do the Soviets no good to build machinery for the chemical, electronic, electric power and machine tool industries if lagging construction fails to provide the plants for them.



Steel Design Meets Overpass Limits

Engineers faced a difficult problem in the design of a $750,000 vehicle and passenger overpass now being built across Canadian National Railways yards in Edmonton, Ont.

The problem was fixed external conditions for the 1,100-ft, four-lane structure. These included fixed terminal points, a 23-ft, 6-in. clearance over the railway tracks and a longitudinal grade of 5%.

Designers met these requirements with 36-in. WF steel beams as the basic structural components. The girders are 230-lb sections, except for the outside girders which support sidewalks on seven spans; those weigh 245 lb per ft. Each girder is strengthened by a 15-in. wide cover plate welded to the bottom flange.

Dominion Bridge Co. fabricated 1,180 tons of structural steel and 335 tons of reinforcing steel in their Edmonton shops. They trucked the beams to the job site and erected them with one 25-ton crane and two welding machines and compressors. Steel went up at an average rate of 80 to 100 tons a day.

The bridge rests on 11 piers and two abutments. Abutments and sidewalls at either end are in fact concrete retaining walls supporting earth fill approaches. There are three boxed plate steel piers in the center of the overpass; designers used structural steel there because of railway track clearance requirements. The others are reinforced concrete.

General contractors are Bennett and Forster of Edmonton. Consulting engineers are C. C. Parker and Associates of Edmonton. The City of Edmonton owns the structure.

Measure any distance at walking speed

records 100,000 ft. automatically!

It's So Easy to measure with a Rolatape . . . and you save time on every estimating job . . . no tapes to wind, no helper is required. You get precision-accurate measurements every time.

Records Feet automatically and the accumulated total is always in full view.

Shows Inches, and Fractions of an inch. Wheel is calibrated in inches and fractions for quick easy reading.

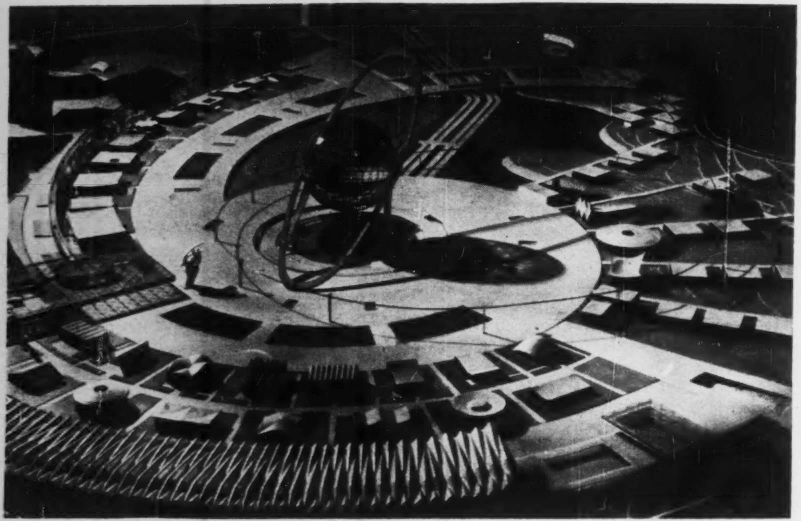
Shows Tenths of a foot. Wheel is calibrated in tenths on reverse side for engineers.

See your engineering and surveying instrument dealer or write for complete information today!

Rolatape, Inc.,
1741 14th St.,
Santa Monica 2,
California

There is a variety of Rolatape Models to suit your needs. See them at your local dealers.

Rolatape
Measuring Wheels



Soviets Plan 1967 World's Fair

Architects and engineers are already submitting construction proposals for Moscow's 1967 World's Fair. Preliminary plans call for construction featuring thin shells, folded plates, ribbed domes, cable-supported roofs and several structures that appear poised to take off for outer space.

The Soviet government has timed the exhibition so that it will fall on the fiftieth anniversary of the Bolshevik Revolution.

The exhibit site will be a wooded area two square miles in the southwest part of Moscow. Access for the expected 15 million visitors will come by way of two subway lines extended from the city's present system and new roads for automobile traffic.

Soviet authorities plan to build about 60 hotels to house visitors. Some of the smaller hotels located near the site will house construction workers before the Fair opens. The largest hotels will be built in downtown Moscow (ENR Mar. 30, p. 45).

Paris Metro to Tie to Railway

The Paris subway system will begin construction this summer of a commuter railway line that will run east and west under the city.

The 10-mile, $500-million express subway line will connect with the French National Railway system in the eastern and western suburbs and funnel commuters into the existing subway system within the city at five transfer points.

The new subway tunnel will run almost directly under the Champs Elysees, the Tuileries Garden and the Rue de Rivoli. Because it will also run under the city's oldest Metro (subway) line, the Neuilly-Vincennes route, the new tunnel will be 80 to 100 ft below street level.

Although the Paris subway system (Regie Autonome des Transports Parisiens) will build and own the line, it will build it to standard railway gage. Trains on the new line will pick up power from an overhead conductor, instead of the third rail common to Metro trains.

Train lengths up to 740 ft combined with 2½-minute headways and speeds up to 63 mph will give the commuter line a capacity of 50,000 passengers an hour in each direction.

The Metro organization will begin construction on a $100-million, 5-mile section running from the Arch of Triumph west to the suburb of La Folie. Present plans call for operation of this section by 1965 and of the entire line by 1970.

Because of the depth of the proposed tunnel and its location under important, heavily travelled avenues, cut-and-cover construction has been ruled out in favor of tunnelling.

Metro officials say the new express subway will relieve pressure on overloaded existing subway lines and divert some commuter traffic from the city's jammed railroad stations.

(*International continued p. 154*)

"40,000 cu. yds. loaded out in record time"

. . . say field reports about these two BAY CITY shovels. Owned by K & R Construction Co. of Camillus, N. Y., they are loading bank run gravel for use as sub-base material on the Empire Stateway Interstate Route at Syracuse. Fourteen trucks are needed to keep up with the two machine's output of 2300 to 2500 cubic yards per 8-hr. day.

You can't help admiring a BAY CITY'S digging ability. Smooth, balanced power is provided through a fluid coupling and speed reducing unit of helical cut gears running in oil. A one-piece continuous chain with automatic adjuster gives positive, powerful and independent crowd action. Power-operated retract is twice as fast as crowd . . . provides positive control of dipper handle throughout the dig-swing-dump cycle. Mechanical power-controlled boosters set the main drum clutches with minimum effort. Smooth acting swingers are engaged through needle bearings on hardened tapered keys — a combination that means quick response, fast swing.

BAY CITY
K&R
BAY CITY

BAY CITY crawler machines are offered as ¾- to 1½-yd. convertible excavators and as 20- to 30-ton erecting cranes. Truck-mounted CraneMobiles, with lifting capacities of 25- to 40-ton, are also available. Ask your local BAY CITY dealer to give you the complete story. Do it today!

BAY CITY **SHOVELS, INC.**
2611-B Center Ave.
BAY CITY, MICHIGAN

a subsidiary of Unit Crane & Shovel Corp.

CIRCLE 153 ON READER SERVICE CARD

A Guide to OP and VP

Gurley Optical Plummet

The Optical Plummet Transit opens new avenues in accuracy, speed and convenience...eliminates inconvenience and lost time involved in centering a plummet over a point.

The Optical Plummet is a telescope through the vertical center (spindle) of a transit. It will point vertically when the transit plate is level. The telescope is turned at right angles by a prism, so that vision is actually horizontal. Setting and adjustment may be checked very simply and precisely by rotating the instrument 180 degrees.

The Gurley Shifting Head Tripod permits 1¾" movement of the transit in two directions 90° separated, without material disturbance to the level of the plate (the Optical Plummet thus remains operative through the entire centering procedure).

Advantages of the Gurley Optical Plummet Transit

- Saving in set-up time, as much as 33%—a factor when a crew is waiting.
- Eliminates swaying plumb bob.
- More accurate centering over point.
- On construction work—sights on points some distance below, such as encountered in bridge work and building construction.
- Made in U.S.A.—Little servicing, but easily repaired when necessary.

Gurley Optical Plummet Transits Available in 21 Combinations

With Circular Compass	With Trough Compass	Without Compass
OP-52	—	OP-57
OP-62	—	OP-67
OP-132	OP TC 137	OP-137

And with limb reading to 1 min.; or 30 sec., or 20 sec. . . . Stiff-leg or Extension-leg Tripods with Constant-Level Shifting Head and wide-frame European-type construction.

Variable Power is standard on Gurley Transits and Levels:

VP

- Wide range of magnification with **one** eyepiece—zooms for near or distant objects
- Easily adjusts to suit weather and light conditions
- Built-in haze filter

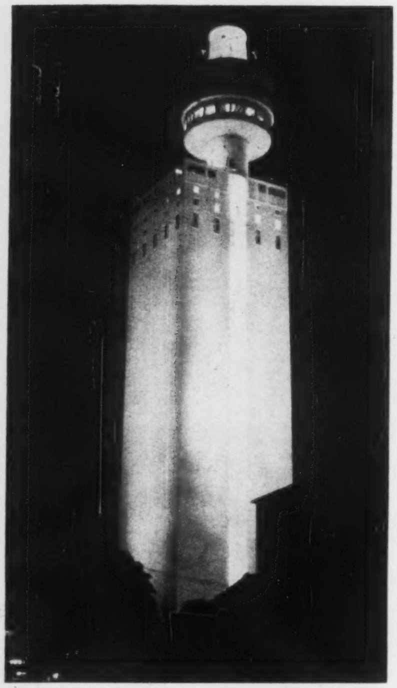
At high power:
- longer shots
- less glare in bright sunlight
- increase in readability
- no glare... high contrast
- blacks and whites stand out

At low power:
- greater field
- brighter field
- decrease of heat waves

We will be pleased to send you further information about both Gurley Optical Plummet Transits and Gurley Variable Power Eyepiece.

Both Optical Plummet and Variable Power are patented.

W. & L. E. Gurley • Union Plaza, Troy, N. Y.



Diners Atop Brewery Spin Before They Touch a Drop

An enterprising German brewer has taken advantage of a 336-ft silo tower to perch a commercially profitable revolving restaurant on top. It gives diners a panoramic view of the area from the tallest building in Frankfurt, West Germany, as they move around the tower at one revolution per hour.

The U. S. will soon have two similar revolving restaurants, one atop a 25-story office building in Honolulu, the other 500-ft above the ground atop the Seattle World's Fair Space Needle. John Graham and Co. of Seattle is architect on the U. S. projects. Both are now under construction.

Tunnelers Undermine Mine To Relieve Its Flooding

Tunnelers working two miles high in the Andes will bore twin tunnels 14,000 ft into a mountain to drain and ventilate the rich Casapalca mine in Peru.

The Cerro de Pasco Corp. recently approved the plan to dewater the lower workings of the mine, heretofore inaccessible due to water conditions. One of the 9 x 10 ft bores will drain the mine, the other will provide ventilation and haulage.

Tunnel construction is expected to take six years. Miners working the ore body down from above will not reach the level of the tunnel for eight years at the present rate of production.

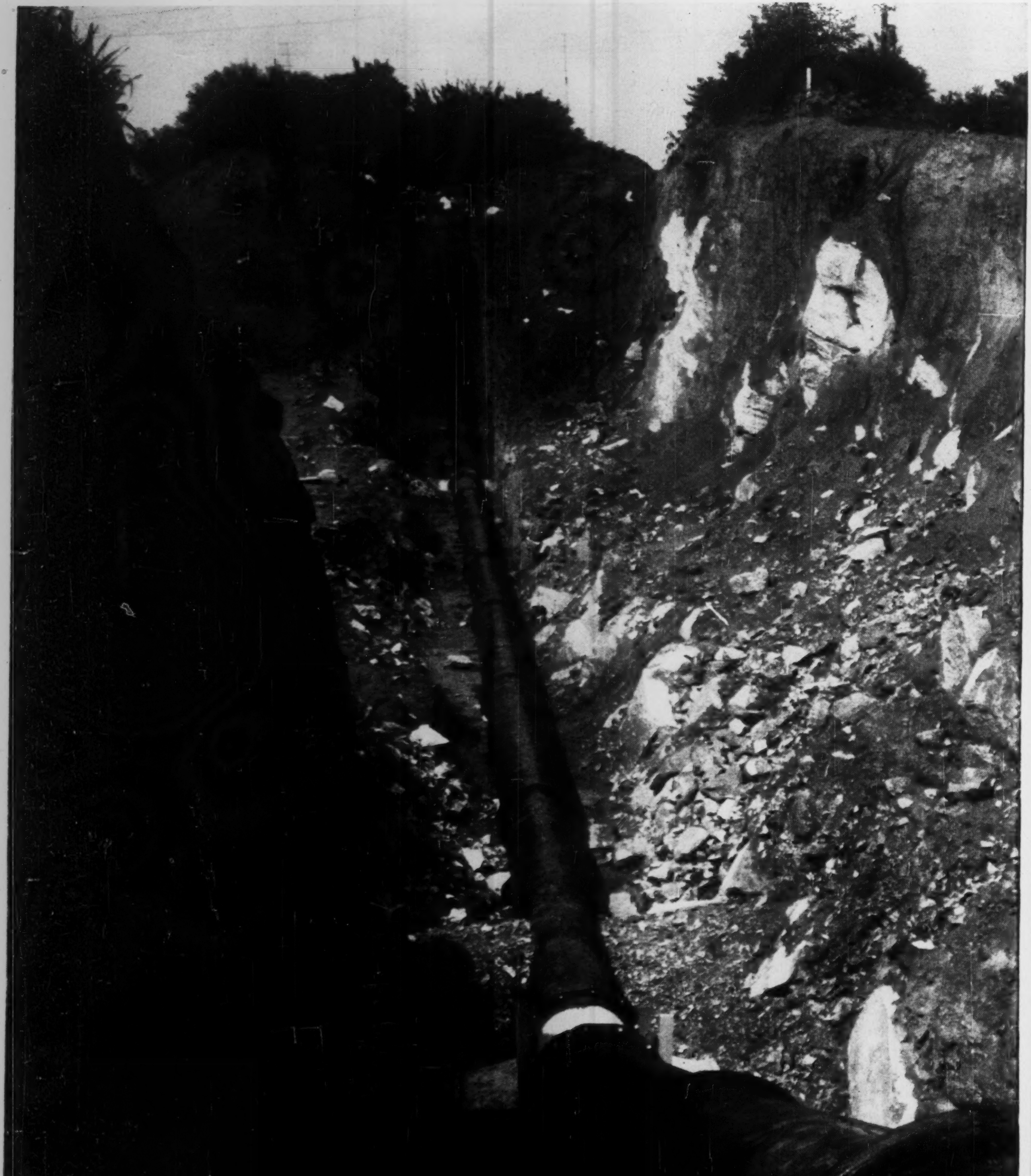
Together, fellow fasteners, we can build an empire!

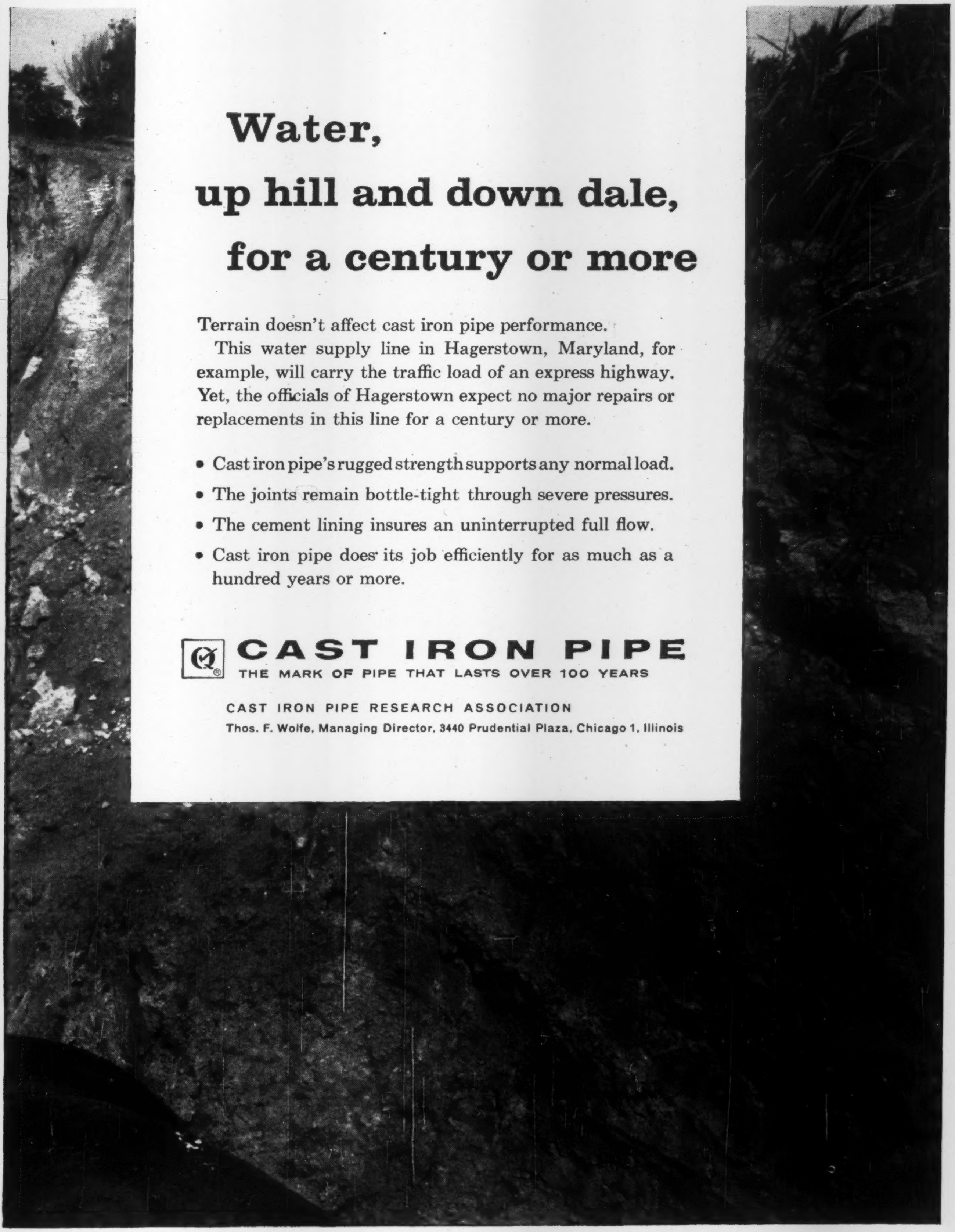
There are 125 different kinds of us, all strong and true and ready to carry our share of the load! We're powder-actuated and we mean business. We have threaded studs and drive pins (super-nails!). There's tall ones, short ones, in-between ones; there's fat ones and there's lean ones. Every last one of us can ram home into steel or concrete with ease. One every *fifteen seconds.* We can attach things down on, up against and suspended from. With our eyepins the Hanging Gardens of Babylon would still be hanging! We're the kingpins. We're the elite. We're austempered, to a man. A tougher group you'll never find. So give us a chance, that's all. Give us a chance and by the George Washington Bridge we'll build you an empire!

Our dealers are assistant empire-builders, but they're listed in The Yellow Pages under TOOLS. Talk to them about *your* empire. (Among other things, they'll tell you why we have red tips.)

Ramset®

287-F Winchester Ave., New Haven 4, Conn. WINCHESTER-WESTERN DIVISION **Olin**





Water, up hill and down dale, for a century or more

Terrain doesn't affect cast iron pipe performance.

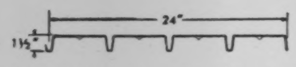
This water supply line in Hagerstown, Maryland, for example, will carry the traffic load of an express highway. Yet, the officials of Hagerstown expect no major repairs or replacements in this line for a century or more.

- Cast iron pipe's rugged strength supports any normal load.
- The joints remain bottle-tight through severe pressures.
- The cement lining insures an uninterrupted full flow.
- Cast iron pipe does its job efficiently for as much as a hundred years or more.

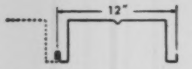
CAST IRON PIPE
THE MARK OF PIPE THAT LASTS OVER 100 YEARS

CAST IRON PIPE RESEARCH ASSOCIATION
Thos. F. Wolfe, Managing Director, 3440 Prudential Plaza, Chicago 1, Illinois

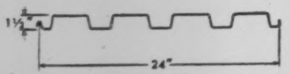
When it comes to roof systems, INLAND covers everything!



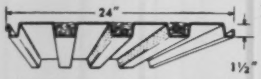
A-DECK — For purlin spacings not exceeding 8′4″. Narrow ribs provide deck surface that supports the thinnest or softest type of insulation.



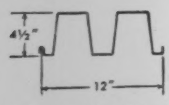
H-DECK — New! For simple spans from 10′0″ to 20′0″ — 3 and 4½″ depths. Especially practical to cover walkways in shopping centers, schools, other installations.



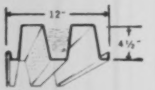
B-DECK — For spans to 10′0″. Wide rib distributes metal for greater structural efficiency — gives higher section properties per pound of steel — well suited for use as side wall panels.



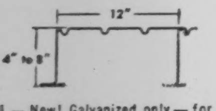
B-ACOUSTIDECK — Two-in-one panel combines steel roof deck with acoustical ceiling having Noise-Reduction Coefficient of .70 — used for spans to 10′0″.



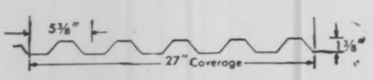
C-DECK—Carries normal roof loads over spans up to 24′0″. Used extensively in canopies.



C-ACOUSTIDECK — Offers same Noise-Reduction Coefficient as B-Acoustideck. Can be used for spans to 24′0″.



T-STEEL — New! Galvanized only — for clear spans to 32′0″. Adaptable to acoustical and flush, luminous ceiling treatments. Provides superior diaphragm to transmit seismic and wind loads.



RIBFORM — High tensile galvanized steel form for concrete slabs over spans up to 8′0″. Three types: Standard, Heavy-Duty, Super-Duty.

◆ Whether your design calls for a dry insulation board roof or for wet-fill, there's an Inland roof system for the job — by the makers of famous Milcor steel building products.

Inland steel deck weighs less than half as much as poured-in-place or pre-cast construction. You can space joists wider and use lighter framework, to save both time and money. Panels are easy to handle and weld in place — in any weather that a man can work.

Types A, B, C, and H decks have the additional advantage of a Bonderized, baked-enamel prime finish that resists on-the-job damage. One field coat of paint on these Inland decks usually covers.

Write for catalogs 240, 241, and 245 — or see Sweet's sections 2c/Inl, 11a/In, and 2a/In.

member of the INLAND steel family

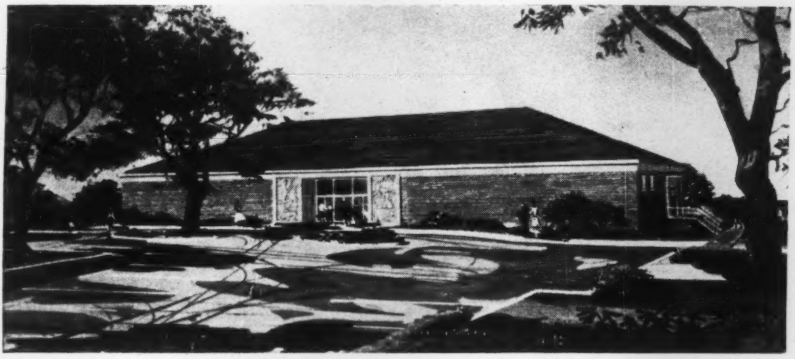
ENGINEERED PRODUCTS DIVISION

INLAND STEEL
PRODUCTS COMPANY
Dept. F, 4147 West Burnham Street
Milwaukee 1, Wisconsin

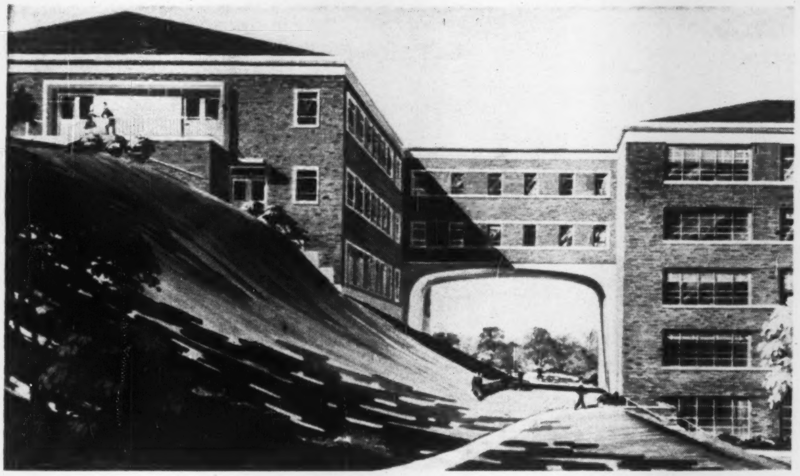
EP-1A

ATLANTA, BALTIMORE, BUFFALO, CHICAGO, CINCINNATI, CLEVELAND, DALLAS, DENVER, DETROIT, KANSAS CITY, LOS ANGELES, MILWAUKEE, MINNEAPOLIS, NEW ORLEANS, NEW YORK, ST. LOUIS

Field and Office



Hilltop Entrance to . . .



. . . Buildings Tied by Bridge

There's no denying that a side-hill site can bring on gray hair in any design office. But an Ohio University project now under construction presents more than just a hair-graying steep slope; there's a bad subgrade condition as well.

A new Arts building at the Athens, Ohio, campus perches on the upper part of a sharp slope. But its designers split the building to jump over a shelving rock formation at the foot of the hill and to build the larger portion on what level space was available.

A three-floor building for offices, gallery and library sits on the hilltop and the slope. From the building's rear a two-story bridge spans 48 ft to the upper floors of a five-story building of studios and lecture rooms.

An underlying rock strata is about 10 ft below grade at the top of the hill and follows the slope down. But where the grade levels off, the rock keeps dropping to about 38 ft below, before it, too, levels off.

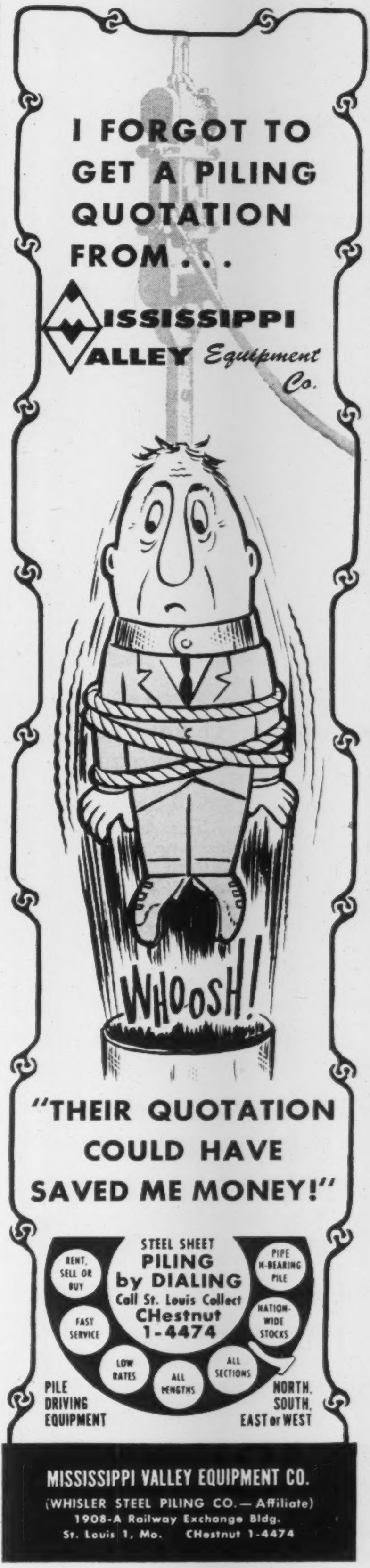
The upper building sits directly on the sloping rock shelf, the bridge gets around—or over—the trouble of building on the dropping rock line at the base of the hill and the five-story studio building rests on drilled footings beyond the transition zone of the rock.

Framing to roof level is reinforced concrete. Floors are waffle construction, undersides painted and left exposed as ceilings. The pitched roofs are framed with steel.

Construction cost is $1¼ million, about $15 per sq ft, $1 per cu ft. Completion is scheduled for next September.

The university project was designed by Potter, Tyler, Martin and Roth, Cincinnati architects-engineers. Baker & Coombs of Ohio, Inc., Columbus, Ohio, is the general contractor.

(*Field and Office continued p. 160*)



I FORGOT TO GET A PILING QUOTATION FROM . . .
MISSISSIPPI VALLEY Equipment Co.

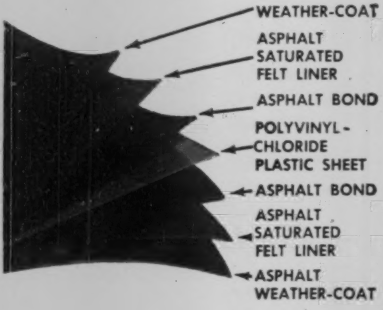
"THEIR QUOTATION COULD HAVE SAVED ME MONEY!"

STEEL SHEET PILING by DIALING
Call St. Louis Collect
CHestnut 1-4474
RENT, SELL OR BUY
FAST SERVICE
LOW RATES
ALL LENGTHS
ALL SECTIONS
NATION-WIDE STOCKS
PIPE H-BEARING PILE
PILE DRIVING EQUIPMENT
NORTH, SOUTH, EAST or WEST

MISSISSIPPI VALLEY EQUIPMENT CO.
(WHISLER STEEL PILING CO.—Affiliate)
1908-A Railway Exchange Bldg.
St. Louis 1, Mo. CHestnut 1-4474

NEW
SEALTIGHT®

"MEADOWMAT"
ASPHALT-PLASTIC
LINERS


WEATHER-COAT
ASPHALT SATURATED FELT LINER
ASPHALT BOND
POLYVINYL-CHLORIDE PLASTIC SHEET
ASPHALT BOND
ASPHALT SATURATED FELT LINER
ASPHALT WEATHER-COAT

. . . for the containment of water, chemicals, brines and sewage.

"MEADOWMAT" Asphalt *armor-coated* plastic Liners combine the strength and elasticity of polyvinyl-chloride plastic with the efficiency and durability of asphalt. This new and unique mat-type liner will effectively solve many problems faced in the control of liquids. Specifically developed to meet the present need for a light-weight, low-cost durable and efficient lining material. "MEADOWMAT" Liners provide a strong, durable material with weight and substance that is easy to place without worry of punctures or tears. Easy to join and seal on-the-job... highly resistant to weathering under exposure to the elements and most acids, alkalais, salts and micro-organisms. "MEADOWMAT" Asphalt-Plastic Liners are nominally one-eight inch thick and presently available in sheets 4′ wide, lengths up to 15′ and weigh three-quarter pounds per square foot.

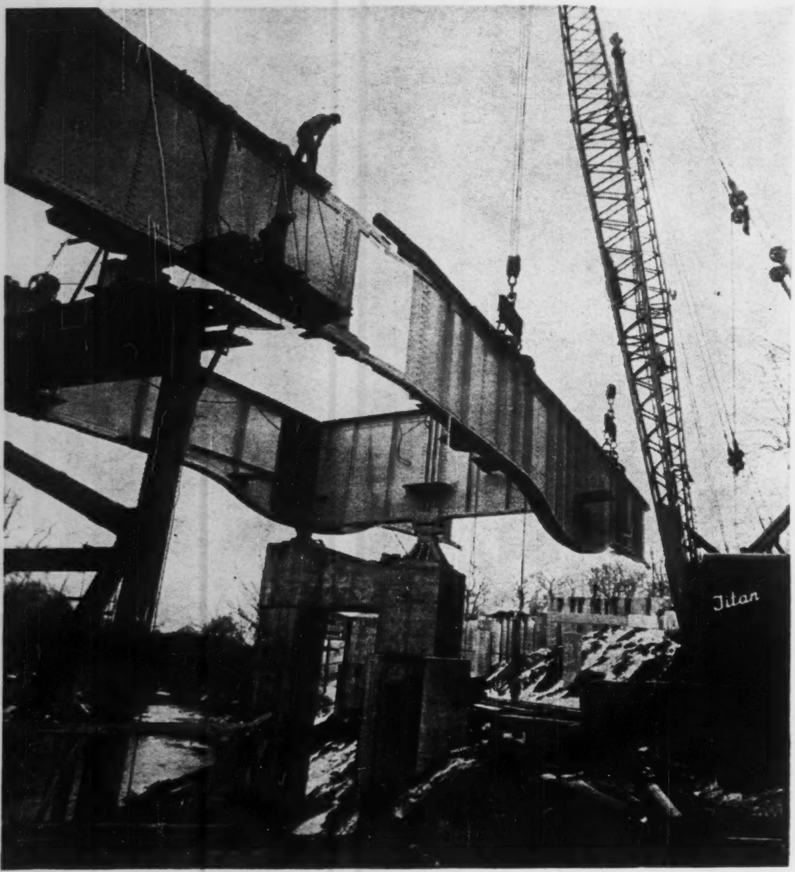
IDEAL FOR LINING . . .

- WATER RESERVOIRS
- CHEMICAL TREATMENT PONDS
- SEWAGE LAGOONS
- GENERAL CONTROL OF LIQUIDS

Write for complete information

W. R. MEADOWS, INC.

16 KIMBALL ST. • ELGIN, ILLINOIS



Cantilevered Beam Carries Girder

Part of a 74-ton, 111-ft-long bridge girder is held in mid-air by two cranes while workmen prepare to connect it to its support—a transverse floor beam cantilevered across an unusual double rocking shoe.

The cantilever construction is made necessary by the close quarters that were so tight that full width piers could not be used.

The structure—part of the Jones Falls Expressway in Baltimore, Md.—is one of two 700-ft-long parallel bridges whose piers had to be squeezed in between railroad tracks and a stream.

The girders, which are 14 ft 10 in. deep at the haunches, were fabricated by Bethlehem Steel and are being erected by C. J. Langenfelder, Baltimore general contractor. Design of the bridge was by Knoerle, Graef & Vender, also of Baltimore.

Epoxy Bonds Blocks into House

Henry J. Kaiser has announced a new method of concrete-block construction that he says will provide low-cost, mass-produced houses for thousands of persons in his Hawaii-Kai development outside Honolulu.

The blocks, with interlocking faces, measure 6 x 8 x 16 in. Workmen prefabricate the blocks into wall panels 7 ft 8 in. high with epoxy adhesive joints.

Roof slabs spanning 18 ft go together the same way, with prestressing tendons threaded through the panels for added capacity. At construction sites, workmen add reinforcing rods to the wall panels to give added strength to the completed structures.

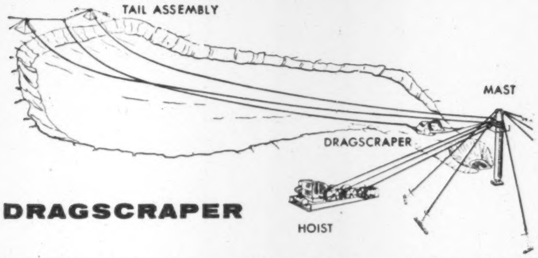
An automated plant produces the block at a rate of 30,000 to 40,000 units a day. A crew of five men operates the electronically controlled line. Volcanic rock and locally produced cement are the prime materials used for making the blocks.

Mr. Kaiser says the all-masonry houses, including three bedrooms and two baths, will sell below $20,000.

Cut Materials Handling Costs in Half . . . Dig *and Haul* with a Sauerman Machine

Operating costs as low as 6¢ per ton are reported by Sauerman DragScraper and Slackline Cableway owners. This cost includes labor, power and maintenance when digging free-caving material on average haul distances.

When you use a Sauerman DragScraper or Slackline Cableway, one machine does *both* digging and hauling from deposit to plant. No double handling is required. You cut labor and equipment costs in half—or even more—because a single Sauerman Machine, controlled by one man, replaces the multiple equipment needed for other methods.

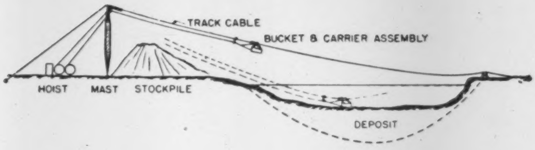


DRAGSCRAPER

DragScrapers are usually recommended for bank or pit deposits. They dig from hillsides or underwater as easily as on level ground and can haul directly to hopper or field conveyor. The Sauerman DragScraper hoist is designed for continuous duty and many years of service. The operator's control station may be remotely located for maximum visibility of deposit and plant.

DragScrapers are built in sizes from 1/3 to 15 yds. to satisfy practically all tonnage requirements.

SLACKLINE CABLEWAY



When deep digging is required or anticipated in the future, a Sauerman Slackline is usually best for the job. This powerful excavator can dig 100 ft. below water, lift its load and deliver the material to a stockpile on a 1000-ft. span.

The Slackliner Bucket inhauls at high speed and dumps automatically. Dumping point is determined by a stop button on the track cable. Gravity returns the bucket to the digging point, completing the fast operating cycle.

The use of a stockpile permits a single 2-yd. Slackline Cableway to handle the material requirements of a 200-tph. plant. Slacklines are built in sizes up to 3½ cu. yds.

★

Find out how you can save with a Sauerman Machine. Write or call, giving tonnage requirements and a description of your deposit. Sauerman engineers will supply their recommendations on the most economical machine for you.

SAUERMAN BROS., INC.

632 SOUTH 28TH AVENUE • BELLWOOD, ILLINOIS
LInden 4-4892 • Cable CABEX—Bellwood, Illinois

CRESCENT DRAGSCRAPERS • SLACKLINE AND TAUTLINE CABLEWAYS • DUROLITE BLOCKS

NEVER A COMPROMISE WITH TUBE-TURN® PIPELINE FITTINGS

Exactly what you need... Exactly when you need it!

KNOWN
tt®
VALUE
LIFESAVER IN PIPING

Why compromise in pipeline design? Choose the exact pipeline components you need from Tube Turns' 12,000 standard fittings and flanges and pipeline specials such as 3R elbows, scraper bar tees, insulating flanges, manifold fittings, hinged closures, and many others.

Why compromise in pipeline construction? Your Tube Turns Distributor will fill all your pipeline component needs on a single order . . . no red tape, no delays. Tube Turns' prompt service keeps your construction timetable on schedule.

Why compromise in pipeline performance? To get all the performance you designed into your pipeline, make sure TUBE-TURN quality goes into the job, not merely into the design specs. Tube Turns Distributors and responsible contractors are glad to give you this assurance with an affidavit that states they have met your specifications to the letter.

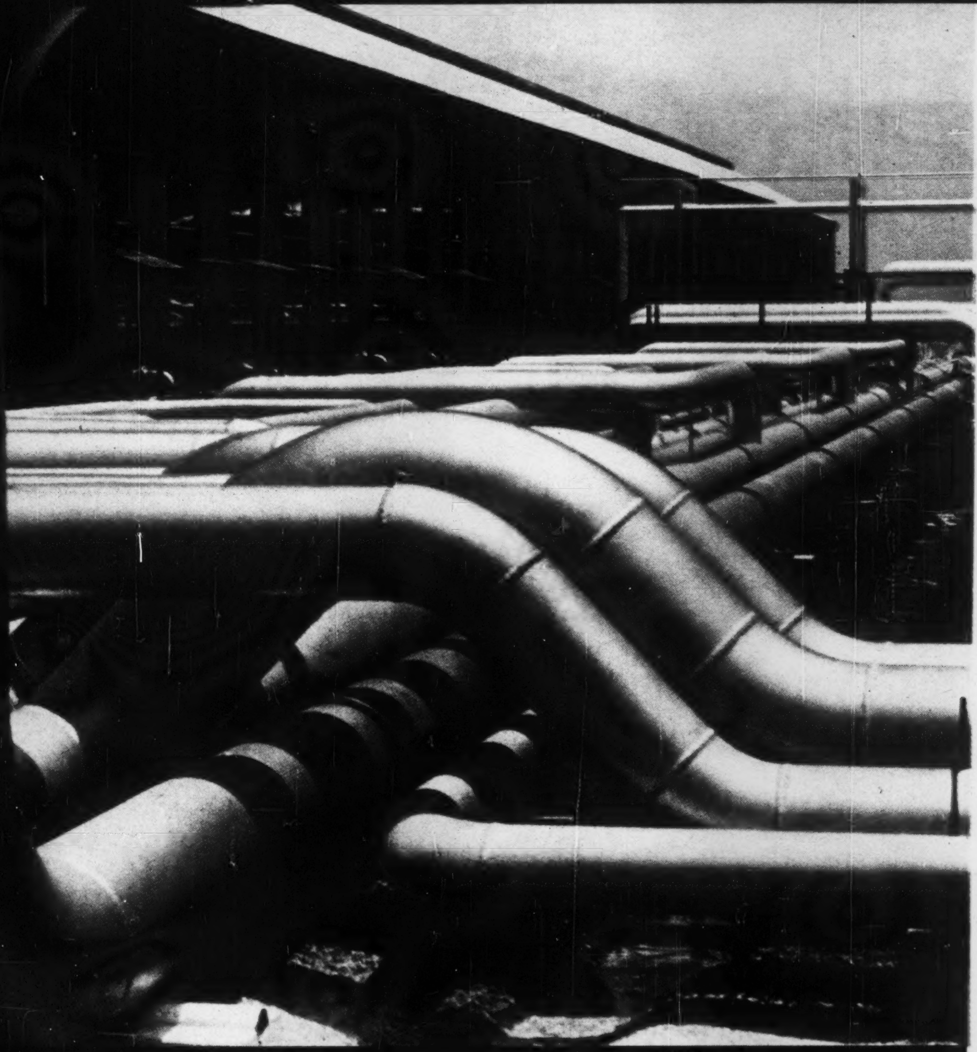
Standardize on TUBE-TURN Pipeline Fittings now, and look for the famous "tt" trademark when you buy. It's your guarantee of quality . . . the mark of *known* value. Write today for TUBE-TURN Pipeline Fitting selection guide . . . ask for Bulletin TT638-F169. TUBE TURNS, Louisville 1, Kentucky.

"TUBE-TURN" and "tt" Reg. U. S. Pat. Off.

TUBE TURNS

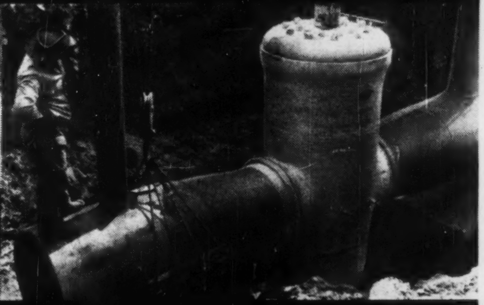
Division of **CHEMETRON** *Corporation*

CIRCLE 162 ON READER SERVICE CARD



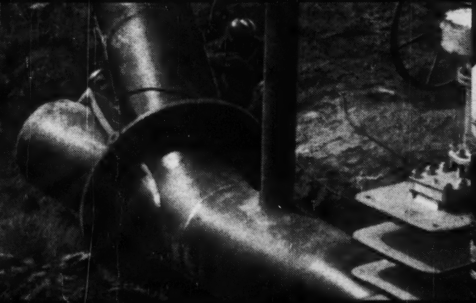
Specify service-proven TUBE-TURN Pipeline Fittings...

Hinged Closures

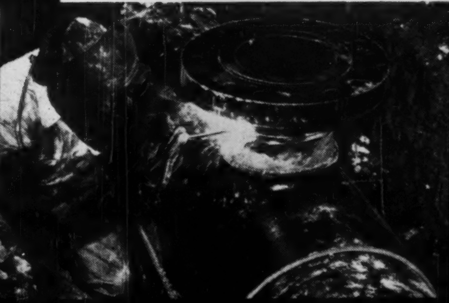


Venturi Reducers

Anchor Forgings



Pig Diverter Laterals



Full-Encirclement Saddles

TUBE-TURN Pipeline Fittings Are Stocked By And Sold Exclusively Through Authorized Distributors

KNOWN tt VALUE

LIFESAVER For The Men Who Design Piping

Tube Turns offers not only the most complete line of properly engineered pipeline components for utmost design flexibility, but a wealth of technical data and able engineering assistance without counterpart anywhere in the world. Standardizing on TUBE-TURN piping products saves time and trouble.

KNOWN tt VALUE

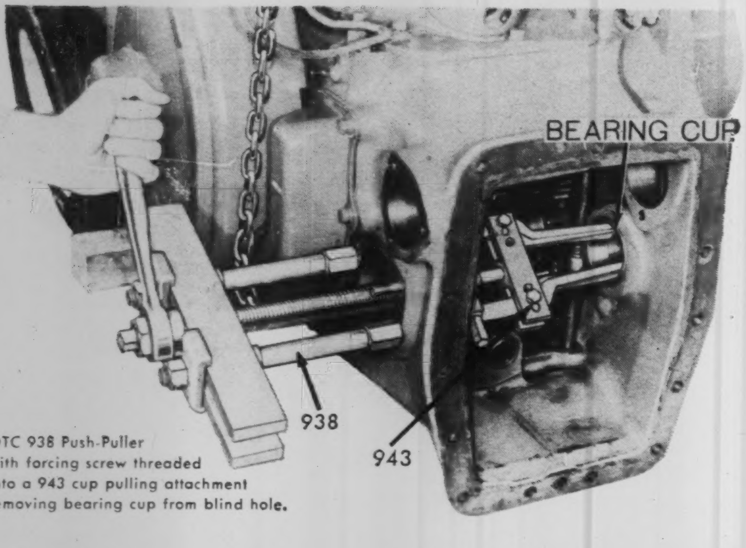
LIFESAVER For The Men Who Buy Piping

The world's most complete line of welding fittings and flanges, over 12,000 regularly stocked TUBE-TURN items, permits every specification to be met without compromise or delay. A fully responsible Tube Turns Distributor is as near as your telephone to give prompt delivery of *all* your needs from *one* source on a *single* order. Saves time, paperwork, multiple checking, piecemeal deliveries and the inevitable problems of divided responsibility. You *save* money when you standardize on TUBE-TURN piping products!

KNOWN tt VALUE

LIFESAVER For The Men Who Install Piping

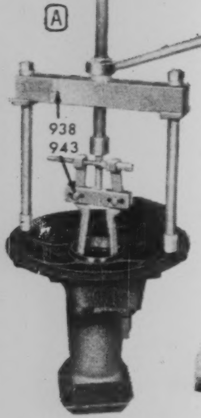
Time is money in pipeline construction. TUBE-TURN Pipeline Fittings do not require remanufacture or compromises . . . or the delays that result from rejections. They are uniform, precision-engineered for easy, time-saving installation. And you can put them in and *forget* them because they *are* dependable. TUBE-TURN piping products cost less because they save more in every way!



OTC 938 Push-Puller with forcing screw threaded into a 943 cup pulling attachment removing bearing cup from blind hole.

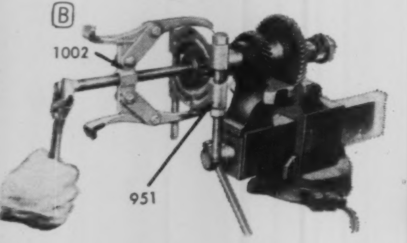
Save time, cut costs in removing and installing cups, bearings, gears, seals, pulleys, etc., with versatile OTC pullers

Save time, up profits by having the right tools in your shop to get the job done quickly, safely, easily — versatile OTC pullers with attachments. Manual or hydraulically operated . . . fit all makes of equipment. Complete hydraulic maintenance sets available in 17½, 30 and 50-ton capacities.



Ⓐ **Pulling rear axle inner bearing cup** without damage or distortion to parts with same OTC-Push-Puller unit shown above.

Ⓑ **Removing transmission main shaft** front bearing quickly and easily with OTC 1002 Grip-O-Matic puller and 951 bearing pulling attachment.



FREE CATALOG

CARS · TRUCKS · TRACTORS

See your OTC distributor or write for further information.

RESEARCH · ENGINEERING · DEVELOPMENT
OTC

OWATONNA TOOL COMPANY
370 Cedar Street, Owatonna, Minnesota
Cable Address: TOOLCO

Designers and manufacturers of the world's most complete line of Maintenance Tools and Hydraulic Equipment.

PULLERS AND PULLER SETS · HYDRAULIC RAMS AND PUMPS · HYDRAULIC SHOP PRESSES · HAND TOOLS

TV Sewer Snoop 'Tracked' To Plot Uncharted Pipes

TV inspection of sewer pipes is proving both popular and practical. But a California contractor has gone a step further in sanitary electronics. He used an "M-Scope" metal detector above ground to track the course of a TV camera as it moved through 100-year-old, uncharted sewer pipes.

The contractor, Haas & Haynie, was preparing to build an underground garage in San Francisco. He wanted to use two old sewers in the area to serve the garage, but couldn't find records of the exact pipe locations.

The detectors are commonly used to locate underground pipelines and cables. Combining a radio receiver and transmitter, the unit sends electromagnetic signals into the ground. The signals bounce off anything metallic and are picked up by the receiver. By using the instrument to track the route of the camera as it checks the condition of the pipe, both the course and condition of the sewers were checked simultaneously.

One sewer was in the way of sheet-piling and was abandoned. The other, in good condition, was put into service.

Up Go the Foot-Candles, Classrooms Get Brighter

The New York City Board of Education may set a precedent in raising lighting intensities in classrooms. Already well into a rehabilitation program that will increase the average intensity of light to 50 ft-candles, the Board now plans to experiment with 80 ft-c.

Although the New York State Department of Education requires a minimum of only 30 ft-c, the Board started to specify 50-ft-c last year for all new schools and major modernization programs. As a result, classroom lighting levels have risen more than 100% since 1953. And the Board believes that the level now provided in New York City schools may exceed that of 75% of the nation's schools.

The rehabilitation program has recenly been extended to upgrade the electrical systems of 200 to 300 schools built before 1939. The Board expects the cost per school, which includes some sanitary improvements, to run between $200,000 and $300,000.

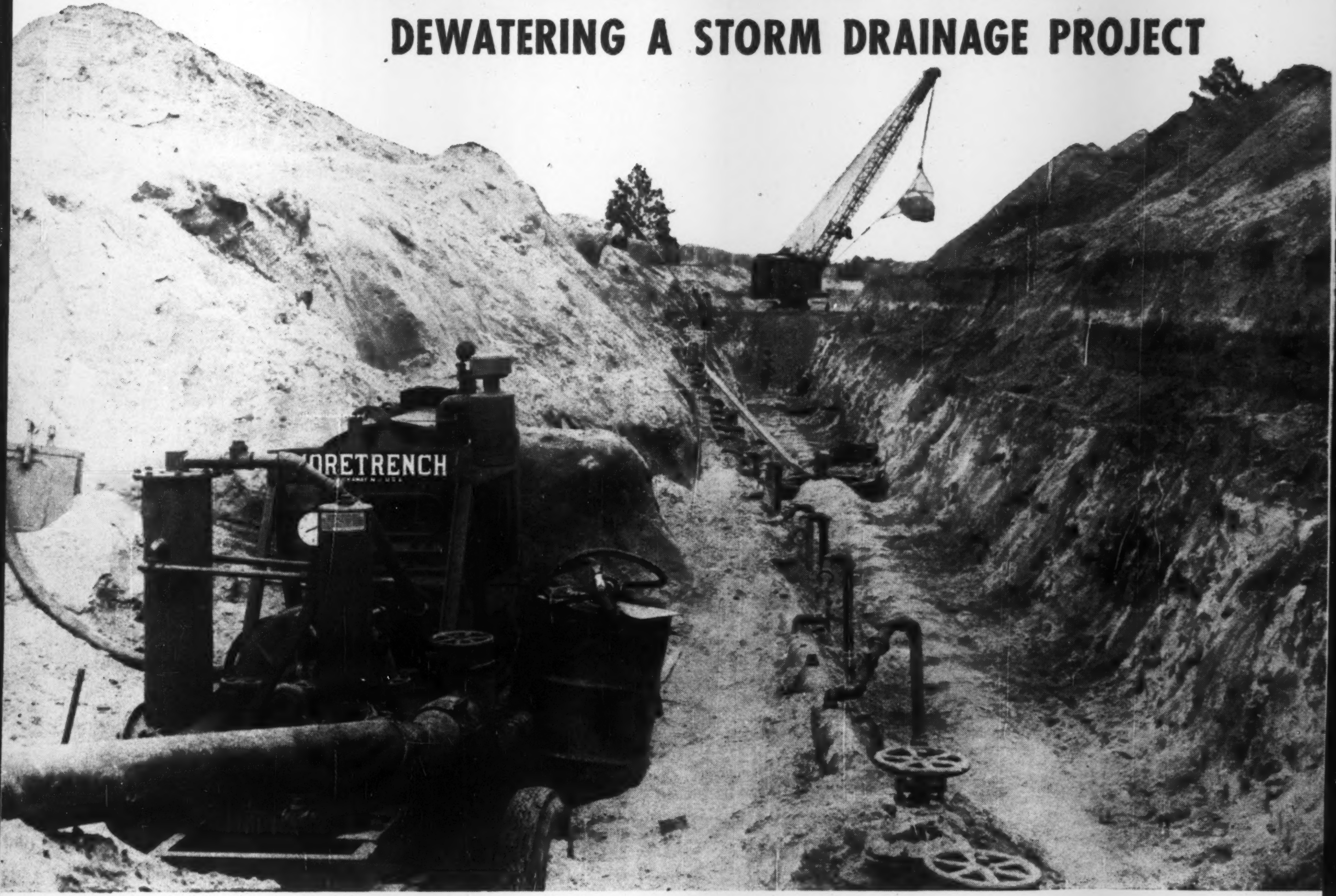
The Board will experiment with 80 ft-c at one school initially. School officials say there will be no harmful glare.

For the record: Light intensities in New York City schools prior to 1924 averaged 10 ft-c. And as late as 1943, only 18 ft-c.

ECONOMY IN ACTION:

MORETRENCH WELLPOINTS

DEWATERING A STORM DRAINAGE PROJECT



Bordeaux Storm Drainage Project, Fayetteville, North Carolina
Contractor: Crowell Constructors, Inc., Fayetteville

Consider how top-notch pumping equipment effects savings:

1. Wellpoints on 5′ centers on one side of the trench only	Lower rental, installation and removal costs
2. One pump pumping on 80 wellpoints keeps trench bone dry	Lower operating and labor costs
3. Firm dry banks are sloped.	No sheeting needed

There's economy in *quality*. When you predrain with a Moretrench Wellpoint System, you're using the best pumping equipment made. Less units do the work. Your final cost reflects this saving. Think about this when you're figuring pumping costs and—get the best.

Call our nearest office for a realistic figure on digging any wet job—in the dry!

Moretrench Corporation

389 Main Street
Hackensack, N. J.
HUbbard 9-7676
New York Tel.: CO 7-2283

4900 S. Austin Ave.
Chicago 38, Illinois
POrtsmouth 7-4212

7701 Interbay Blvd.
Tampa 9, Florida
TAmpa 61-1881

315 W. 25th St.
Houston 8, Texas
UNderwood 4-7774

Rockaway
New Jersey
OAkwood 7-2100

WESTERN REPRESENTATIVE: Andrews Machinery of Washington, Inc., Seattle 4, Washington
CANADIAN REPRESENTATIVE: Geo. W. Crothers Limited, Toronto, Ontario
BRAZILIAN REPRESENTATIVE: Oscar Taves & Co., Ltd., Rio de Janeiro

STEEL CONSTRUCTION IN AN 8-STORY APARTMENT BUILDING? YES AND IT SAVED $80,000

For the builders of new Hinman House in Evanston, Illinois, steel offered exceptional flexibility of design and a direct saving of $80,000 in construction costs. The 8-story building has 80 deluxe apartments. Typical floors are 68' x 165' and cubic footage totals 1,020,000.

"We saved in many ways," says Mr. Roy Schoenbrod, the architect. "Designed and bid both for steel and for concrete, the steel bid proved to be decidedly less expensive. What's more, during construction we observed that steel construction made the job easier for the pipe trades such as heating, air-conditioning, conduits and plumbing. Work went faster and labor costs were reduced considerably. This was our first experience with steel on a building of this size, but now that we've seen what it can do, we'll think of steel first from now on."

Use Steel for Modern Construction

STEEL CONSTRUCTION OFFERS design flexibility

. . . freeing the architect and engineer from patterns of the past . . . allowing unlimited play to creative imagination. In the practical solution of space design, large column-free areas are easily achieved. Cellular floors can be tack-welded to beams and girders providing built-in space-saving raceways for present and future power, phone and signal lines.

high strength with low weight

. . . reducing foundation costs due to excessive dead load. . . . reducing floor heights which in turn save considerably on exterior wall surfaces while reducing the overall cubage required for the air-conditioning load.

and economy

. . . savings readily apparent when steel bids are compared with material other than steel. What's more such savings accrue regardless of size of building—from horizontally structured apartment houses or hospitals to vertically-reaching hotels or office buildings. Earlier occupancy, interest savings on construction loans, lower labor costs, all contribute to make steel by far your best actual and potential value for every construction dollar.

INLAND ®

INLAND STEEL COMPANY
30 West Monroe Street • Chicago 3, Illinois

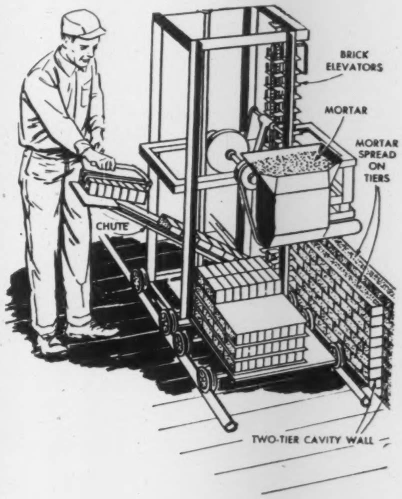
Wide Flange Beams • Steel Plates • Bearing Piles and Steel Sheet Piling • Ti-Co® Galvanized Sheets • 4-Way® Safety Plate • Enameling Iron • Sub-Purlins

CIRCLE 167 ON READER SERVICE CARD

Machine Lays 900 Bricks an Hour

A track-mounted, electrically powered machine, now in the prototype development stage, can lay 15 bricks a minute, according to its father-son inventor team. They adapted the machine especially for cavity-wall construction, though it can also lay one wythe of brick veneer or a 4-in.-thick brick wall.

The machine is housed in a steel frame about 6 ft tall, 4 ft wide and 3 ft long, weighing 450 lb. Powered by a ½-hp electric motor, it rolls along a 27-in.-gage track formed by 2½-in. dia pipe secured to the top of the mason's scaffold.



The Auto-Mason spreads mortar in a continuous stream to a point just ahead of each brick before it is placed. A "pickoff" cam transfers bricks from a chute to an elevator, which lifts them to proper elevation and places them through a guide frame on alternate sides of the cavity wall.

The inventors claim that the controlled mortar bedding of the machine eliminates mortar droppings in the 2-in. cavity space. These mortar droppings can reduce the insulating value and the moisture-penetrating resistance of a cavity wall.

The machine is designed to simulate the action of a human bricklayer. A press tamps the brick into final position and shoves it length-wise to extrude enough mortar ahead of it to form the vertical joint.

Machine controls allow the operator to set variable thicknesses to the horizontal mortar bed. Varying the speed at which the machine rolls along the track determines the thickness of the vertical joint, for the machine lays brick at a constant rate of 15 per min.

The Auto-Mason lays straight runs only; masons must lay up the corners and point all joints. When the machine finishes laying a course, the operator stops it, adjusts it to lay the next course, reverses its direction and sends it on its way. The operator also feeds bricks into the chute and feeds mortar into the hopper, in quantities sufficient to bond about 30 bricks. From one scaffold level the Auto-Mason has a vertical range of 4 ft. For higher courses, the scaffold must be built higher and the machine reset.

Under the firm name of Demarest Machines, Port Washington, L. I., the inventors have built only experimental walls with their prototype machine. They expect to produce machines to sell for about $5,000. Patent is pending.

Researchers Compare Paving Costs

Stanford Research Institute has concluded that asphalt paving holds an economic advantage over portland cement for use on principal highways.

A report issued by SRI states that asphalt pavement not only costs less to build, but also has a lower over-all annual cost when spread over a 40-year period. Maintenance costs are about equal for both types, said the Institute. The research team collected cost information on 2,500 individual highway projects in 21 states and for 13 toll roads.

The SRI project compared the two pavements by combining five major elements: initial cost, resurfacing cost, annual maintenance cost, time to first resurfacing, and interest on the capital investment.

The Stanford researchers found that the total average annual cost per two-lane mile for all projects is $5,371 for portland cement concrete compared to $3,760 for asphalt concrete, using an interest rate of 5%. These figures, according to the report prepared by SRI, indicate a theoretical saving over a 40-year period of about $64,400 per two-lane mile, or $1,611 per year.

Where portland cement concrete was used, the study said, the initial cost for

ONE MAN JOINTS IN JUST 10 SECONDS!

McDowell
FAST LINE
Portable Steel Pipe with Integral Couplings
for
- compressed air lines
- water lines in construction applications

EASY INSTALLATION
Couplings are assembled and tightened by hand. No special tools needed.

LIGHT WEIGHT
One man can handle 30 foot section weighing 40 lbs. Saves time moving from one location to another.

LEAK PROOF
Leakproof gasket is built in; will not dislodge during transportation, installation or disassembly.

FLEXIBLE
Easily follows branch lines, sharp radius curves and natural contours.

Available in nominal sizes:
2", 2½" and 3"
Couplings adaptable to standard pipe

Insert tube end into coupling.

Twist nut tight *that's all!*

Write for full details and literature

McDowell
MANUFACTURING COMPANY
PITTSBURGH 9, PA.
Quality Metal Products Since 1900

all projects averaged $79,700 a mile (two lanes), and the resurfacing cost was $24,200 (two lanes). For asphalt the figures per two-lane mile were $47,200 and $19,800.

Maintenance costs for both pavements over the 40-year period averaged about $250 a year, the study found, while the average time between initial construction and first resurfacing for portland cement was 26 years compared to 18 for asphalt. However, it was found that portland cement concrete required a thicker overlay than asphalt, which contributed to the higher cost for resurfacing concrete.

For roads on the National System of Interstate and Defense Highways, the initial cost of portland cement was $79,500 per two-lane mile, compared to $55,300 for asphalt. Again using an interest rate of 5%, the average per mile per year cost for portland cement was put at $5,353 compared to $4,232 for asphalt. Over the 40 years, this would mean a theoretical $44,840 (two-lane mile) savings with asphalt.

The SRI project also analyzed costs for a "very heavy design" standard for both asphalt and portland cement. Such a design, the researchers said, would take into consideration extremely adverse conditions of soil and traffic.

A very heavy design portland cement pavement would average $79,800 per two-lane mile while a comparable asphalt design would cost $59,800. The difference over 40 years, at 5%, would be $925 per year per mile in favor of asphalt, or $37,000 over the 40 years.

The states visited were: California, Colorado, Connecticut, Florida, Illinois, Kansas, Kentucky, Maine, Maryland, Massachusetts, Minnesota, Mississippi, New Hampshire, New Jersey, New York, Ohio, Oregon, Pennsylvania, Texas, Virginia and Washington.

SRI undertook the project at the request of the American Petroleum Institute.

Traffic Test Favors Computer

A computer-regulated traffic control system operated recently in Toronto on a pilot basis can save large cities $20 million to $40 million in highway construction costs and some $2 million annually in driving costs by increasing street traffic capacities, according to its developers.

The system operates traffic signals throughout a city under control of a high-speed digital computer. Vehicle detectors at busy intersections count approaching vehicles and transmit the information to the computer. Every two seconds the computer measures the flow of traffic toward and through the intersections and decides whether to extend or change the green-red traffic signal pattern.

The system's memory can trace groups of vehicles through city travel corridors and give each the best possible traffic light treatment consistent with good over-all traffic control.

Traffic Research Corp. of Toronto and New York City conceived and developed the system under instructions from the traffic engineers of the City of Toronto and the Municipality of Metropolitan Toronto.

According to Traffic Research Corp., it costs a city the size of Toronto (1.5 million population) from $2 million to $4 million for every 1% increase in street-carrying capacity achieved by construction.

The developers' report on the 20-month Toronto pilot operation says that their system could be installed to cover 500 intersections for $3 million.

(See p 69 for more on traffic control by computer.)

Tractor to Explore Frozen Lakes

An underwater tractor that will ride on the undersurface of ice in a lake is being designed by the University of Wisconsin. Researchers will use the device to study underwater plant and animal life and physical conditions in frozen lakes. They expect such studies will lead to better use and development of water resources.

Previous studies have had to be confined to areas the width of holes cut in the ice.

The underwater tractor will be remotely controlled by sound impulses and carry a small radioactive source by which scientists will track its movements.

The tractor body is an airtight aluminum box, 4 ft long and 14 in. square, It carries an electric motor and batteries, and rides on two air-filled, spiked wheels and a sled runner. The body floats, pressing the wheels and runner against the ice.

The tractor will pull testing equipment at one-half to two miles an hour for four hours without battery recharging.

JOISTOLOGY*

HAS ADDED VERSATILITY—

TO MODERN FLOOR AND ROOF CONSTRUCTION

***joist-ol′o-gy, n.** (As Webster *should have* defined it) The art or science of designing and building more economical structures through the use of open web steel joists.

Architects and engineers have found that steel joists have given them practically a free hand in the design and construction of today's buildings. These lightweight, space-saving structural members have been adapted to virtually every size and style of building, whether it's one story or twenty, ultra-modern or ultra-conservative.

Steel joists have done more than provide high-strength support for floors and roofs. They lend themselves so handily, and so economically, to the incorporation of overhung roofs, cornices, balconies and other architectural embellishments into building design.

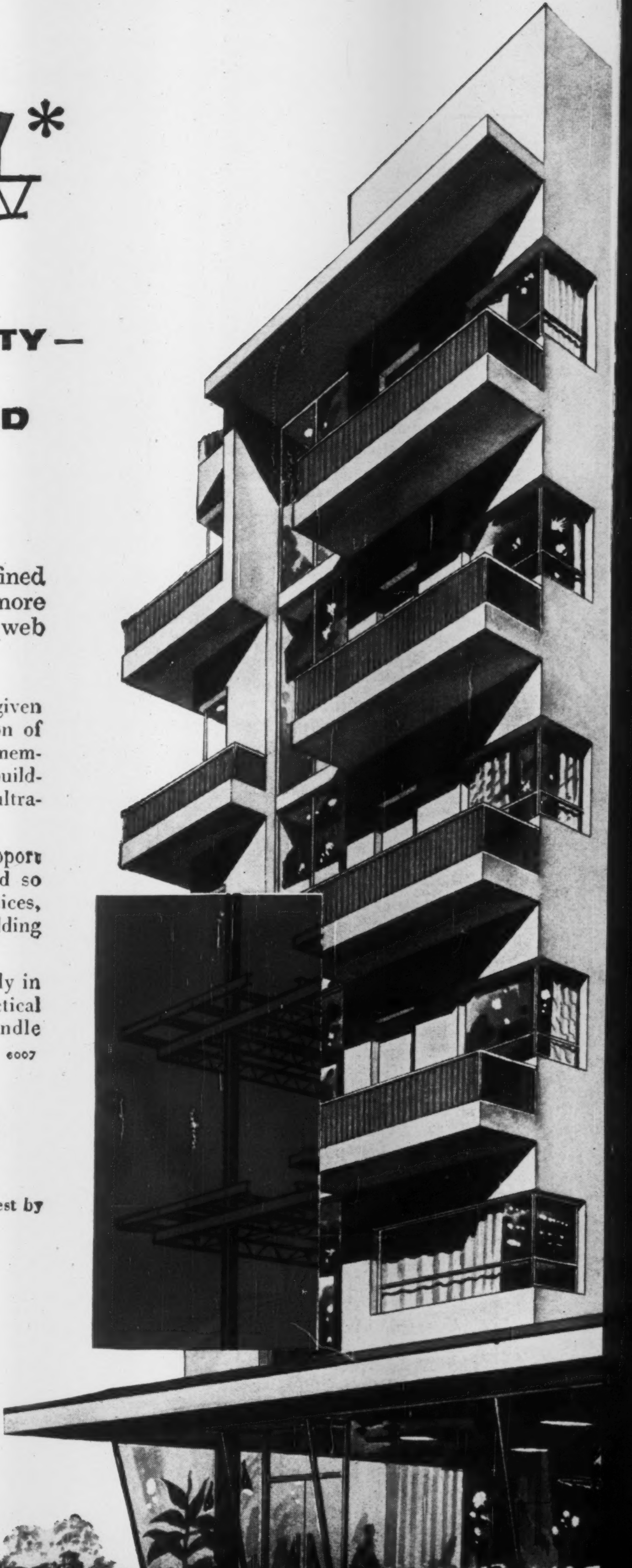
With material costs and erection time figuring so prominently in construction plans these days, steel joists still offer the practical answer to the need for economical, versatile, easy-to-handle structural materials.

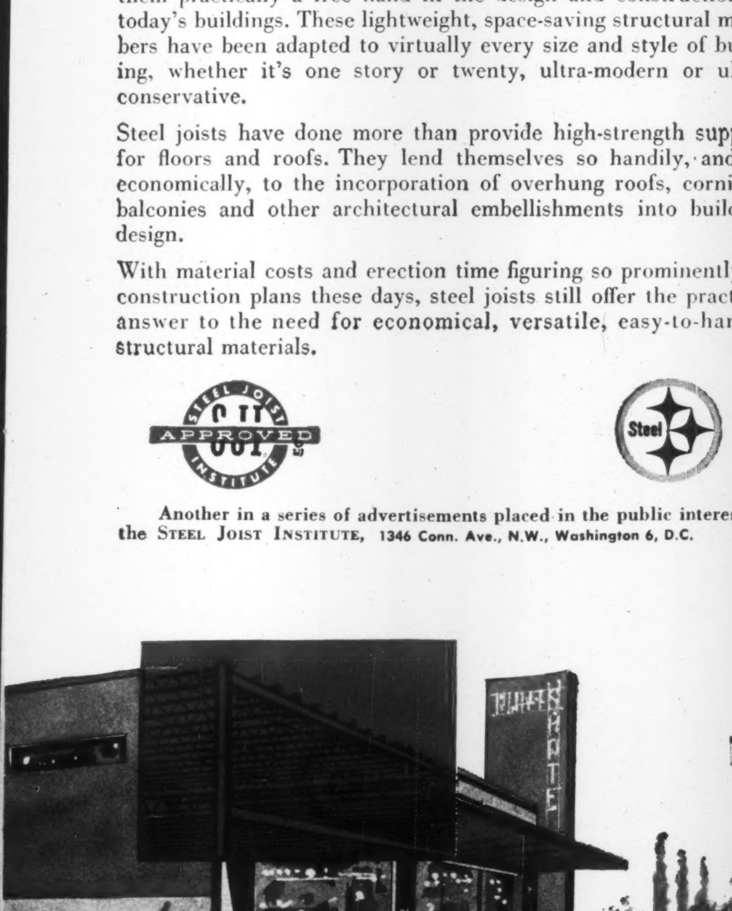
6007

STEEL JOIST INSTITUTE SJI APPROVED

Steel

Another in a series of advertisements placed in the public interest by the Steel Joist Institute, 1346 Conn. Ave., N.W., Washington 6, D.C.





European Tower Cranes Coming to U.S.

Harnischfeger Corp. will import fully revolving tower cranes designed and manufactured in Europe. Liebherr Ltd., manufacturer of the cranes, has produced over 15,000 during the past 10 years. They will be sold in the U. S. through Harnischfeger's 80 dealers.

There are two basic designs. One is supported at ground level; the other climbs from floor to floor up through the elevator shaft as the building is erected.

Both types have a revolving vertical tower with a jib mounted near the top. The towers, or masts, are electrically welded steel angle construction and about 5 ft square. The jibs are welded tubular steel.

The tower cranes are available in a wide range of tower heights, jib lengths, lifting capacities and hoisting speeds. They are self-erecting and may be freestanding, guyed with wire ropes, braced to the structures being erected, or mounted on standard-gage railway carriages. Smaller models may be mounted on pneumatic-tired chassis.

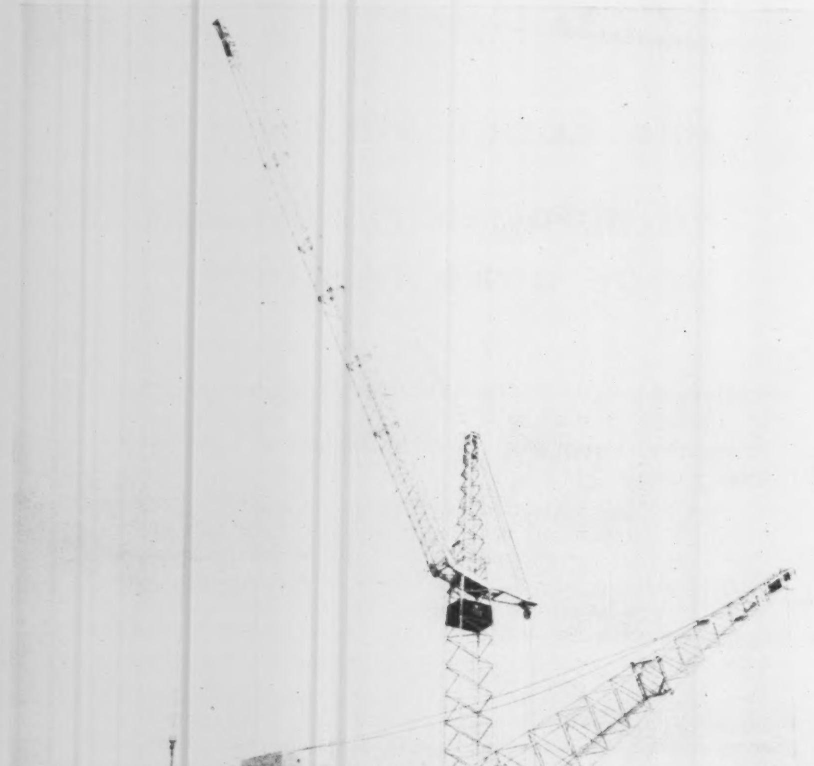
Tower cranes have masts ranging from about 50 ft to 350 ft., and lifting capacities ranging from four tons to 25 tons. There are five sizes of climbing cranes, with corresponding lifting capacities.

Four of the newest models—operating either as tower or climbing cranes—combine several features of advanced design, according to the manufacturer. These include hydraulic derricking of the jib and elimination of the derricking rope; high-speed hoisting; and fast erection and dismantling.

The smallest of the four rigs, Model 12HB, can lift 1,500 lb at 59 ft maximum radius. The largest crane, Model 50HB, lifts 3,700 lb at 98 ft maximum radius or 8,800 lb a 11½ ft minimum radius. There are two hoisting speeds for each standard model, with top speed reaching 216 fpm. A top speed of 475 fpm is possible by using an electromagnetic clutch and a three-speed gear hoist. The fully-revolving cranes rotate at speeds of 1.3 rpm for Model 12HB to 0.8 rpm for Model 50HB.

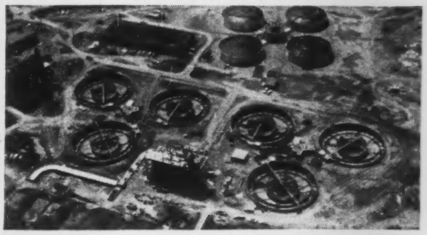
The revolving platform, which houses the gear units and supports the jib, climbs under its own power without rereeving wire ropes as the telescoping tower is extended upward. A 12-ft section of tower can be added in about 15 minutes.

(*New Products continued p.* 175)



BASIC LIEBHERR CRANES that will be sold by Harnischfeger are the climbing crane (foreground) and the rail-mounted tower crane (rear).

Before you buy any storage tank...



take a look at

PRESTRESSED CONCRETE

CHEMICAL • PULP and PAPER • PETROLEUM • NUCLEAR • CEMENT • WATER SUPPLY No matter what your storage problem, from municipal water supply to phosphoric acid, a prestressed concrete tank offers many immediate and long term advantages. Adapted to your individual needs, prestressed concrete tanks have an enviable record of low maintenance and long service life. Elevated, surface or underground, lined or unlined, special or standard domes ...here is storage capacity to meet your needs. Write or call for your copy of our new bulletin "Prestressed Concrete Tanks."

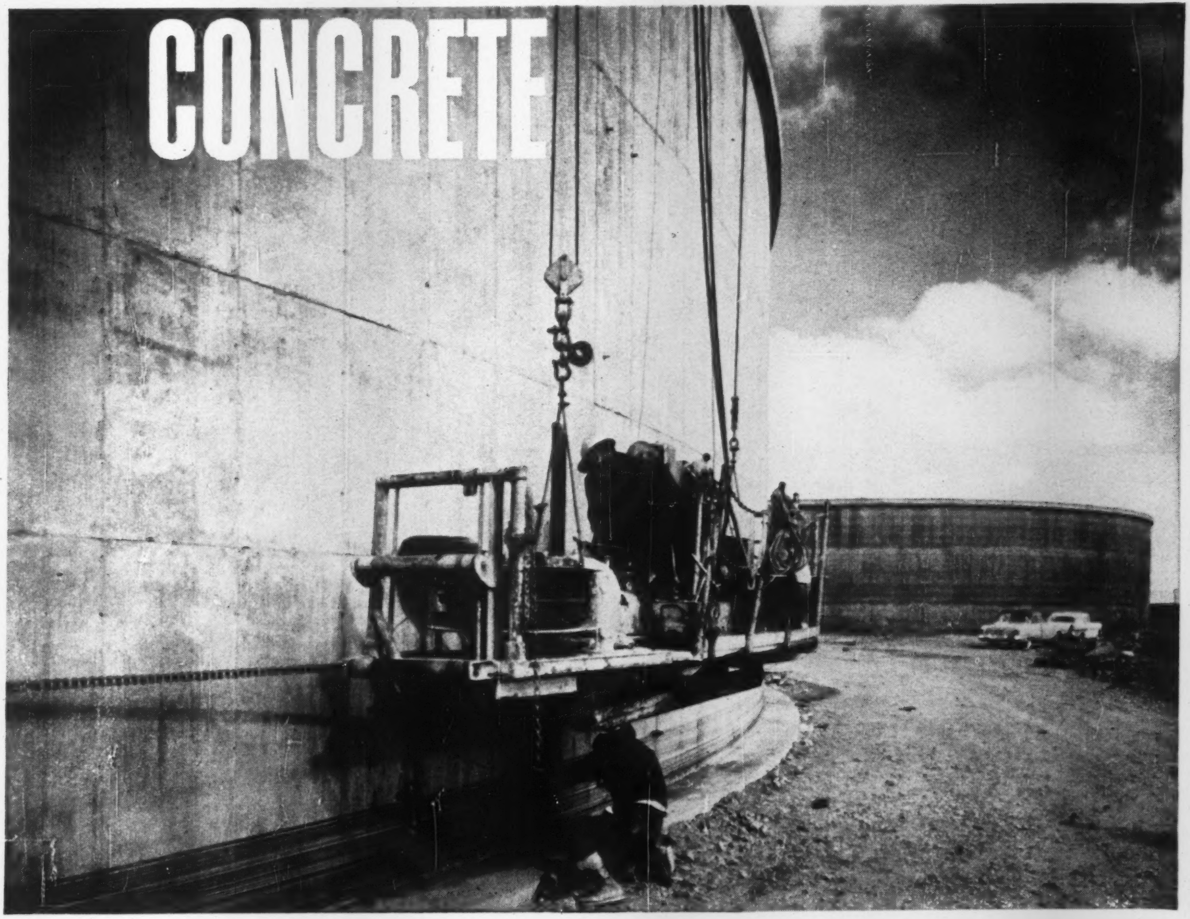
THE PRELOAD COMPANY, INC.
355 Lexington Ave., N.Y. 17, N.Y. 1216 Hartford Bldg., Dallas 1, Texas
Tel.: MUrray Hill 7-0488 Tel.: RIverside 8-4047

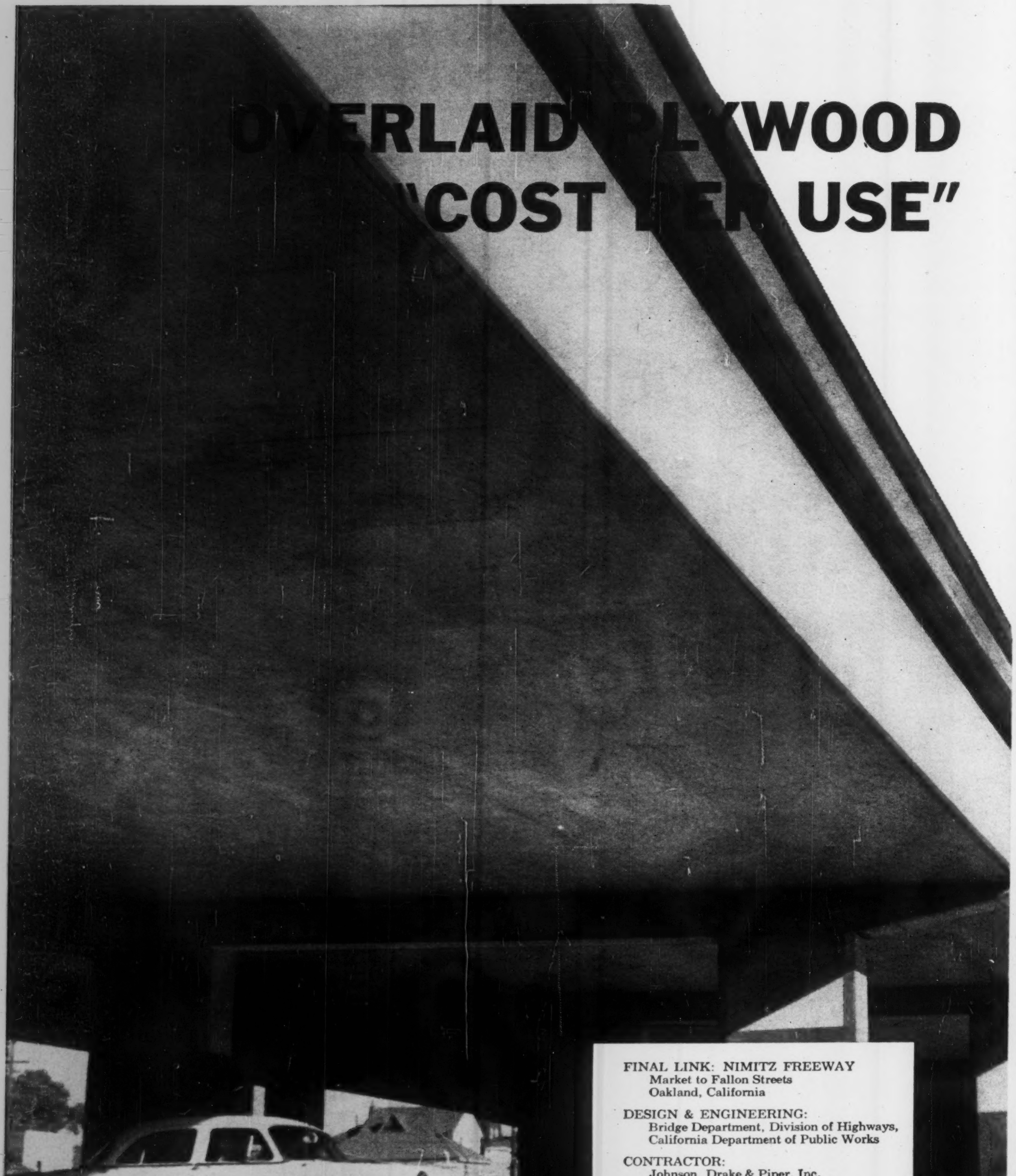
PRELOAD CONCRETE STRUCTURES INC.
837 Old Country Rd.
Westbury, L.I., N.Y.

THE CANADA GUNITE COMPANY, LTD.
125 Hymus Blvd.
Pte. Claire, P.Q., Can.

HERRICK IRON WORKS
28400 Clawiter Rd.
Hayward,
Calif.

PRELOAD



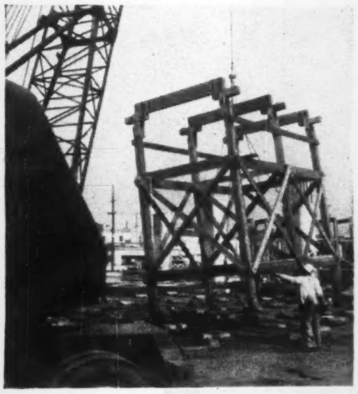

OVERLAID PLYWOOD
"COST PER USE"

FINAL LINK: NIMITZ FREEWAY
Market to Fallon Streets
Oakland, California

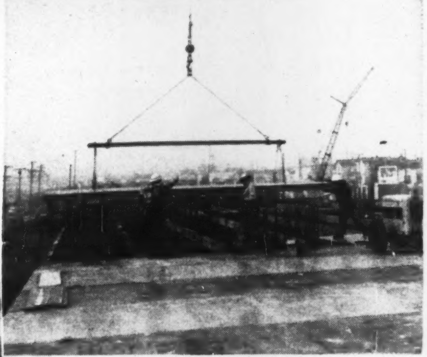
DESIGN & ENGINEERING:
Bridge Department, Division of Highways,
California Department of Public Works

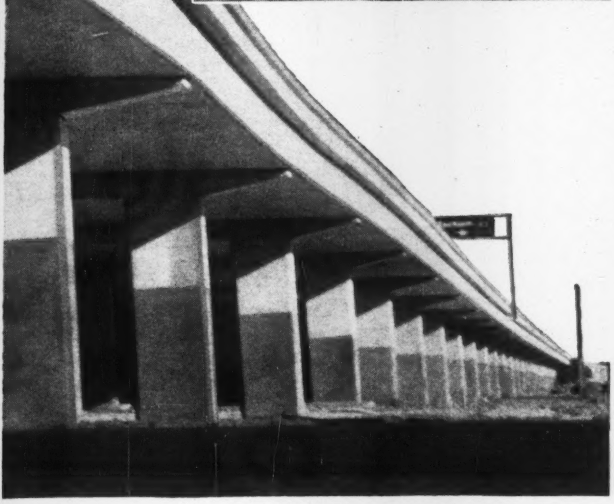
CONTRACTOR:
Johnson, Drake & Piper, Inc.
Oakland, California

FORMS GIVE LOWEST ON ELEVATED HIGHWAY



In carefully planned sequence of operations, prefabricated shoring towers were positioned, screw-jacked to required height. Deck form sections were then crane lifted into position.





High density overlaid plywood concrete form panels give over 50 re-uses, cost less than .007¢ per sq. ft. of form per pour.

"THE EXTRA RE-USES we got from overlaid plywood more than offset its greater initial cost," says George Krenkel, project manager for Johnson, Drake & Piper, Inc., contractors for this 1.55-mile long 8-lane elevated highway.

"Even after giving upwards of 50 re-uses, a large percentage of the panels were salvaged for additional use on other jobs," Mr. Krenkel reports. "Besides being more economical in terms of cost per use, overlaid plywood creates much smoother concrete and is easier to strip and clean."

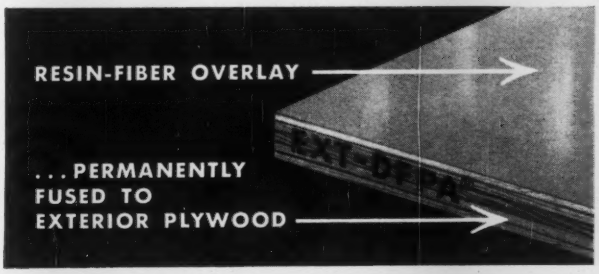
On the job over 50,000 sq. ft. of ⅝″ overlaid plywood was used for deck slabs, columns and guard rails. Prebuilt 8′ x 20′ and 8′ x 22′ deck forms were supported by ingenious prefabricated shoring towers which were leap-frogged as pouring progressed. Screw jacks were used to raise towers to required heights. Stripping was accomplished simply by lowering jacks until the forms came free.

DFPA
TESTED
QUALITY

DOUGLAS FIR PLYWOOD ASSOCIATION
TACOMA 2, WASHINGTON
—a non-profit industry organization devoted to research, promotion and quality control

HIGH DENSITY OVERLAID FIR PLYWOOD is a premium concrete form panel intended for jobs that require ultra-smooth concrete surfaces and/or many re-uses (up to 200 re-uses may be obtained with properly designed and constructed forms). Base panel is EXT-DFPA® Exterior plywood.

Standard concrete form grades are: *Interior PlyForm®* with water-resistant glue for multiple (up to 10-12) re-uses; *Exterior PlyForm®* (waterproof glue) for up to 25 or more re-uses.



Get your pipe stringing investment out of the mud

Nothing bogs down men and machines on a pipe stringing job like old man mud . . . especially when heavy equipment churns the stuff into a thick batter. To side-step the mud and leave a workable right of way for the pipe gang, a Sikorsky helicopter was used by Petroleum Helicopters, Inc. to string some of the pipe for the Trunkline Gas Company in Texas. Not only were the crews able to work more easily and faster because they were not hampered by as much mud, but the helicopter also made it possible to complete the job days ahead of schedule at the substantial saving of about 30 cents a foot. Why not put your investment where it won't get slowed down, where it can move ahead and produce faster results for you. Find out the interesting facts about using or owning a Sikorsky helicopter. It can cut the time and cost of stringing pipe, of setting river weights in swampy areas, and of other lifting and trucking operations. Write today for all details.

SIKORSKY AIRCRAFT Stratford, Connecticut
Division of **UNITED AIRCRAFT CORPORATION**

The cranes are electric driven and can be operated either from the cab on the revolving platform or by remote control from any place on the construction site, according to the manufacturer.

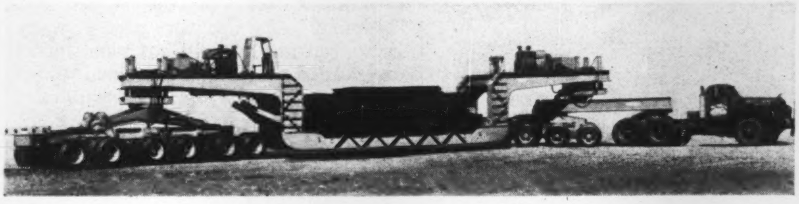
Two levers on the control panel operate master switches that simultaneously perform all four motions—hoisting, derricking, rotating and, in the case of mobile cranes, travelling.

The control panel contains a red pilot light that indicates any overload. An audible safety device also warns of an overload. The control panel also has a "dead-man's" control, which stops all motion of the crane as soon as the operator removes his hands from the operating levers.

Limit switches control safety of hoisting operations, derricking, overloading and travel limits for rail carriages. They are enclosed and waterproof.

The cranes can be transported over the highway by a tractor in front and a trailer under the rear. The jib is slung under the tower, and the top section of tower is telescoped into the adjoining section to reduce the length of load. The loaded crane has a travel height of 13 ft and a travel width of 8 ft 3 in. Model 50HB building crane with 45 ft of tower and a 100 ft jib weighs about 22 tons.

A four-man crew with one of these tower cranes or climbing cranes can erect building components as fast as a 12-man crew with some other types of hoisting equipment. HARNISCHFEGER CORP., 4400 WEST NATIONAL AVE., MILWAUKEE 46, WIS.



85-Ft Trailer Rolls on 40 Wheels

A truck-trailer, built in the United States for use in Iran, is claimed by its manufacturer to be the largest unit of its kind ever assembled. It's 10 ft wide, just one inch under 85 ft long, and it travels on 40-bogie-mounted wheels.

In addition, it carries engines front and rear for power steering of both front and rear bogies and for raising or lowering its centrally located drop-bed carrying platform.

In use the trailer requires a minimum of three operators—one to drive the towing tractor, one at each end of the trailer. Where grades are steep, a second tractor, pushing from behind, adds a fourth operator, and pushes the overall length of the rig up to 136 ft. Because of the length, the operators coordinate their activities by means of a four-way telephone hook-up.

The big trailer is designed for carrying 110-ton transformers from the Iranian port of Khorramshahr, to Dez River Dam, 170 miles inland. The route is tortuous; hence the need for articulation. It is also rough, yet part of it is in a low tunnel, hence the need for being able to raise and lower the drop-bed.

On rough terrain, the bed is hydraulically raised to clear obstructions; within the tunnel, it is dropped so the generators can clear the tunnel roof by 6 in. TRAILMOBILE INC., 31ST & ROBERTSON ST., CINCINNATI 9, OHIO.

Aging Yields New Alloy Steels

An 18% nickel alloy resulting from a new aging process is said to achieve a yield strength of 250,000 psi, and a nil ductility temperature below −80 F. Notched tensile strength, with a 0.0005-in. notch radius, is said to exceed 400,000 psi.

Basic composition: 18% nickel, 7% cobalt, 5% molybdenum, less than 0.5% titanium and a maximum of 0.05% carbon.

According to the manufacturer, strength levels greater than 500,000 psi are possible with this process; and the finished alloy offers excellent machining, cold forming and welding characteristics.

The process, called mar-aging, consists of holding nickel-alloy steel for about three hours at 900 F, then allowing it to air cool to room temperature. Solution annealing at 1,500 F prior to mar-aging is optional. INTERNATIONAL NICKEL CO., INC., 67 WALL ST., NEW YORK 5, N. Y.

DOWN TO FUNDAMENTALS

BASIC TRIPOD DESIGN

No instrument is better than its tripod. As an essential part of its down-to-fundamental concept in Surveying Instruments, KERN has pioneered radically new, functional tripods designed to augment the efficiency of its functional instruments. These afford maximum stability, regardless of location, are little affected by wind and require minimum set-up time.

PROMPT, RELIABLE SERVICE
FACTORY TRAINED TECHNICIANS

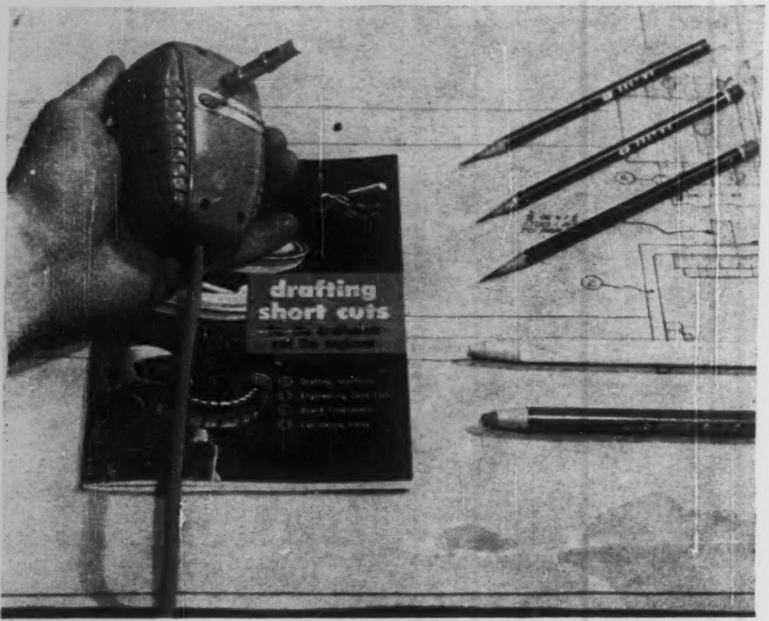
KERN
INSTRUMENTS, INC.
FUNDAMENTAL SURVEYING EQUIPMENT
120 Grand St., White Plains, N.Y.

Unique Centering Tripod

Levels and centers instrument in seconds with remarkable accuracy. Assures exceptional stability with ball-and-socket head. Bayonet type instrument coupling. Ideal for Autocentering. All-metal tripods available.

For Complete Details Write for Brochure K607

DRAFTING
TRENDS



Three POST aids to increased drafting speed shown clockwise: Self-switching Mercury electric eraser; Triangular-shaped Try-Rex drawing pencils; Peel-off eraser sticks.

New drafting conveniences increase efficiency

Mercury Electric Eraser—Try the full-automatic Mercury eraser for really effortless corrections—it turns *on* when you pick it up, turns *off* when you put it down. So quiet and vibration-free that it takes a touch of the high speed shaft to convince you its interference-free motor is running!

Furnished with an assortment of eraser tips suitable for fast, smooth removal of soft or hard pencil lines, typewritten material, even printing. Accurately erases a one-letter typing error, yet speedily removes large areas of an engineering tracing. Palm-fitting, easy to handle. Durable plastic housing with non-slip finger grips makes erasing a pleasure instead of a chore. The low, $16.50 price is quickly paid for in time and trouble saved.

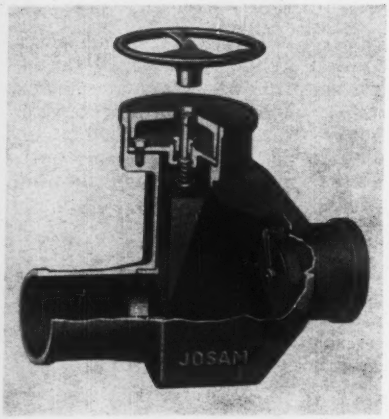
Try-Rex Drawing Pencils—Embodying the first new pencil design in years, a rounded, triangular casing, the Damascus Try-Rex pencil provides more than a relaxed and comfortable grip. Its three flat sides not only fit the controlling three fingers, but indicate to the draftsman a succession of 120° stops which help position the pencil for uniform line weight and density. Precise grading of lead hardness, plus color-tip coding, further aid production of better tracings and clearer prints.

Pencil-Style Eraser—An eraser capable of hairline control often saves re-drawing of fine detail in small-scale work. For such precise work, there's nothing better than a POST 2934 Pink Pearl eraser, now available in peel-off, self-sharpening pencil style. The POST 2933 Magic-Rub is also a paper-wrapped, peel-off type, but provides a white vinyl tip for clean erasing of drafting film. Both give real convenience when exacting erasure is needed.

Further information on all of these worthwhile POST drafting aids is available from your nearest POST dealer. Or, write Frederick Post Company, 3654 North Avondale Avenue, Chicago 18, Illinois.

POST

SENSITIZED PAPERS & CLOTHS • TRACING & DRAWING MEDIUMS • DRAWING INSTRUMENTS & SLIDE RULES
ENGINEERING EQUIPMENT & DRAFTING SUPPLIES • FIELD EQUIPMENT & DRAFTING FURNITURE



Gate Valve Backs Up Flap For Backwater Control

Two features of the Series No. 1140-ZZ backwater valve prevent water from backing up into basements from overloaded sewers during sudden storms—an automatically operating flap valve and a manually operated gate valve.

The flap valve has vanes designed so that water will spin the flap to clean the seat.

The gate valve is spade shaped to cut through debris.

The flap valve closes at the slightest backflow. If protection is desired for long periods, the gate valve may be closed manually until waste lines to sewers can be used again.

Both valves may be reached from floor level and the wheel handle is removable so that the top of the valve fits flush with the floor. JOSAM MANUFACTURING CO., MICHIGAN CITY, IND.

Pinch Valve Opens Wide At Low Line Pressures

A new pinch valve opens all the way even when the operating pressure in a line is below 10 psig. This "positive-opening" Series L, RKL valve also has full elastomer facings to protect the metal body flanges.

The maker recommends the valve for process control, vacuum service, for placing on the suction side of pumps and for corrosive, abrasive or viscous liquids and for dry powders.

Sizes range from ¼ to 14 in. ID for a maximum operating pressure of 400 psig. This new valve can be furnished for hand, air, electrical or electro-hydraulic operation.

Pinch-valve body can be made of any commercially available elastomer.

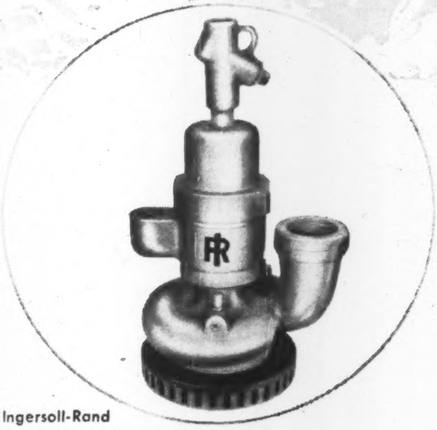
The metal case of the valve is normally cast aluminum, but can also be had in cast iron. RKL CONTROLS, INC., HAINESPORT, N. J.

NEW BANTAM PUMP

...a boon to contractors

...utility crews!

an Ingersoll-Rand exclusive! NEW—automatic constant lubrication of water seals from a pressurized grease reservoir in the housing!



Ingersoll-Rand
Size 225 Air
Operated Sump Pump

An easy 34 lb. load for one man, and only 16 in. high, this new baby of the Ingersoll-Rand Pump Line can move 190 gallons per minute against a 15 ft. total head.

The new I-R 225 Pump is ideal for pumping water, oil, sewage or sludge out of sumps, trenches, manholes, tanks and bilges.

Other newly designed features include a more efficient and longer lasting multi-vane motor, stainless steel parts at critical locations to prevent corrosion, and a rugged alloy housing and impeller.

Standard equipment includes exhaust hose assembly, air strainer and air throttle valve.

For details or an on-the-job demonstration, call your nearby Ingersoll-Rand representative or write: Ingersoll-Rand, 11 Broadway, New York 4, N. Y.

Ingersoll-Rand
11 Broadway, New York 4, N. Y.

219A-18

TRAFFIC ENGINEERING; PLANNING and OPERATIONAL

URBAN MASTER PLANNING

SUB-SOIL INVESTIGATIONS and FOUNDATION DESIGN

Planning, design and supervision of construction of

RAILROADS, MOTOR FREIGHT and TRANSIT FACILITIES

PIPE LINE TRANSPORTATION

SHOPPING and COMMERCIAL DEVELOPMENT PROJECTS

DRIVE-IN THEATRES

HIGHWAYS, BRIDGES and STREETS

MISSILE BASES and MILITARY STRUCTURES

DAMS, WATERWAYS and EARTHWORKS

SEWERAGE SYSTEMS

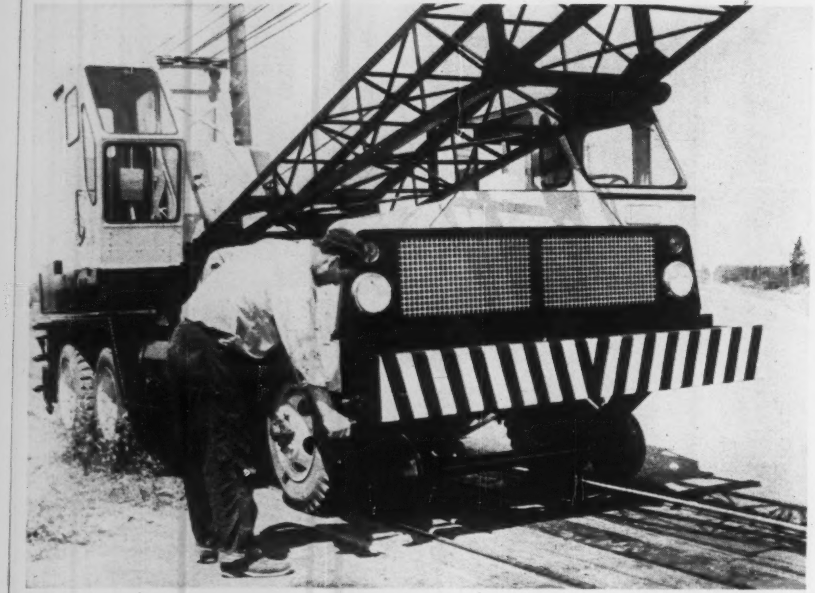
AIRPORTS

CLARKESON

skilled engineering meeting public needs

We invite you to contact us for a comprehensive brochure, listing completed projects and case histories, and including our statement of experience and areas of specialization.

Clarkeson Engineering Company, Inc.
and
John Clarkeson — Consulting Engineer
Dept. 21
285 Columbus Avenue,
Boston,
Massachusetts



Truck Crane Becomes Track Crane

Crank operated, flanged steel wheels mounted at the front and rear of a truck crane chassis to make it possible to use a truck crane as a self-propelled rail mounted machine.

The steel wheels, which can be raised or lowered in a matter of minutes, lift the rubber tired front wheels of the crane clear of the track and take the weight off the driving wheels while leaving them in contact with the rail for propulsion.

The switch from rail crane to truck crane operation can be made at any grade crossing. Harnischfeger Corp., Milwaukee 46, Wis.

Roto-Mixer Has Hydrostatic Drive

A self-propelled, in-place soil stabilization machine now features a hydrostatic drive, and according to its manufacturer the result is greater mixing efficiency, increased production and more economical operation.

The machine, called the Roto-Mixer, is designed to mix, blend, aeriate and pulverize materials down to a depth of 10 in.

When material is windrowed the Roto-Mixer is credited with a blending capacity of 3,000 to 5,000 cu yd per hr. For scarified material, the capacity of the mixer is said to be up to 1,000 cu yd per hour.

The hydrostatic unit on which the machine depends for power transmission consists of crankshaft-driven dual pump and a hydraulic motor connected through selector valves by high pressure fuel lines. This linkage provides 12 forward speeds ranging from ½ mph to 8½ mph and three reverse speeds. Power for the machine is supplied by a diesel engine that is rated at 140 hp at 1,800 rpm.

The Roto-Mixer is 18 ft long, 8 ft wide and has a 7 ft wide mixing chamber. Its turning radius is 23 ft and its optional equipment includes spray bars for oil or water, pump flow meter and lights for night work. Road Machinery Div., Bros Inc., 1057 Tenth Ave. S. E., Minneapolis 14, Minn.

Improved Toro Tractor Can Mow, Tow or Dump

An improved Toro Model V general tractor can be used with 3, 5 or 7 gang mowers to mow up to 80 acres per day. The machine can also be used with a 1-cu-yd steel dump body and can be used to tow trailers, sprayers, drags or rollers.

Among the optional equipment available with the Model V are power steering, power take-off, governor, platform extensions, horn, directional signals, headlights and tail lights. The machine can travel over highways at speeds up to 40 miles per hour. Toro Mfg. Corp., Minneapolis 6, Minn.

NEW
CONCEPT
in wire rope design
7
6
5
4
3
2
1
SHIP TO
WIRE ROPE USERS
EVERYWHERE
7-FLEX
PATENT APPLIED FOR
MADE IN U.S.A.
VIA BEST WAY
REELS • COILS • FEET EACH • REEL NO. • OUR ORDER • CUSTOMER'S NO.
DESCRIPTION 7-FLEX PREFORMED PREMIUM
WHYTE STRAND IWRC
MACWHYTE COMPANY
MANUFACTURERS OF WIRE ROPE
KENOSHA, WISCONSIN
7-FLEX
PATENT APPLIED FOR
Premium Whyte Strand IWRC

BIGGEST NEWS in wire rope in years!

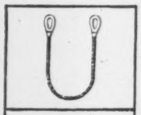
You owe it to your company to learn about Macwhyte's new 7-FLEX.® But—be prepared to change your thinking about wire rope!

You've never seen another wire rope like 7-FLEX — there is no other like it! It's an *all-purpose* wire rope, flexible as 8-strand — rugged as 6 x 19 — fatigue-resistant like a 6 x 37.

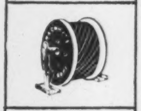
There is 16⅔% more wearing surface in 7-FLEX than there is in a 6-strand rope. There is less unit pressure between rope and sheaves, so less rope and sheave wear. There is more sheave contact, less rope-creep. Result: longer rope life, less downtime, lower operating costs!

7-FLEX can make important savings on many wire-rope applications. Ask any Macwhyte distributor. Free Bulletin 60100-R available upon request.

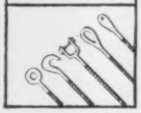
Other Macwhyte products that serve you profitably



Slings — Safe, easy-to-handle Macwhyte slings for every lifting need are available in round-braided, flat-braided, or Safe-Guard styles. Many standard designs. Also custom-made to your requirements. Send for Bulletins 5308-R and 5886.



Corrosion-Resisting Wire Rope — Many sizes and constructions in Stainless Steel, Monel Metal and plastic or nylon coated. Meet the requirements imposed by alkaline and acid conditions and marine atmospheres, temperatures, and humidity. Send for Bulletin 49-30.



Wire Rope Assemblies — Safe-Lock wire rope assemblies are precision made to your order in the size, length, and strength needed. Uniform high quality with fittings permanently swaged to the rope. Many standard designs. Send for Catalog 6101.

INDUSTRIAL ★ AIRCRAFT ★ MINING ★ LOGGING ★ ELEVATOR ★ MARINE ★ CONSTRUCTION ★ DRILLING
THE RIGHT MACWHYTE
MACWHYTE WIRE ROPE
MADE IN U.S.A.

MACWHYTE *Wire Rope* COMPANY

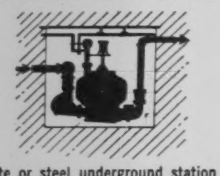
2900 FOURTEENTH AVENUE, KENOSHA, WISCONSIN

Wire Rope Manufacturing Specialists Since 1896

248

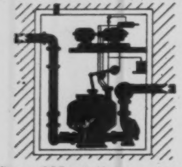
Which sewage lift station is best for your job?

TOPS IN DEPENDABILITY AND SAFETY



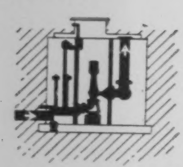
Concrete or steel underground station with Shone® Type S pneumatic ejector, mechanically controlled (warranted 25 years). Remote air supply. Nothing electrical; maintenance free, operates even under water. For municipalities and large subdivisions.

SURPRISINGLY VERSATILE, INEXPENSIVE



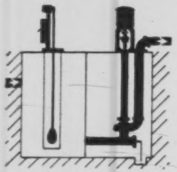
Shone® Type SAC station, underground in concrete vault. Mechanically controlled ejector (warranted 25 years) has its own compressor. Frequently less costly than package stations. Finds use everywhere.

PACKAGE STATION



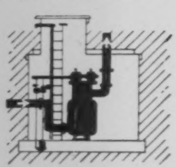
Quality underground station with vertical, short-coupled (Series 6260), dry pit centrifugal pumps. Quality design and equipment give good service life at nominal cost. For small permanent stations, growing areas.

LOW FIRST COST—EASY INSTALLATION



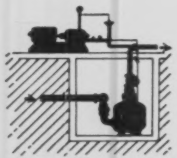
Two-compartment steel basin with centrifugal vertical wet pit pump. Pumps are not submerged; motors protected from flooding. Low first cost; fast installation. For buildings, small growing subdivisions.

ULTIMATE IN PACKAGE DESIGN



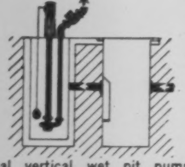
Package underground station with Expelsor® pneumatic ejector, electrode controlled. Sanitary and dependable, low maintenance, easy to service. Recommended for municipal and subdivision applications.

BUILDING TYPE STATION



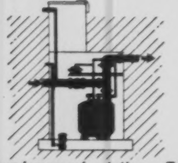
Expelsor® pneumatic ejector station designed for use in buildings. Compressor is on basement floor; ejector on floor below. Sealed installation gives safe, odorless handling of sewage indoors.

SPECIAL PROBLEMS?



Centrifugal vertical wet pit pumps with adjoining settling basin. Good for areas where sand or old sewers create problems. Special pump construction for abrasive or corrosive conditions, industrial wastes.

MAXIMUM RELIABILITY—MINIMUM SPACE



Package underground station. Expelsor® pneumatic ejector has two compartments, duplex compressors and controls. Excellent service accessibility. Especially suited for subdivision and municipal lift stations.

The answer depends on the job. Is it to be a temporary station? What about future loads? How much maintenance will it get? What type of power is available? These and many other questions must be weighed carefully and without bias. In making the decision, why not put Yeomans 61 years' experience (59 on underground stations alone) to work? Because Yeomans builds **the only complete line** of sewage lift stations in the industry, recommendations are **impartial** and in your best interest. Phone, wire, or write now.

L-5911

YEOMANS

1999-1 North Ruby Street,
Melrose Park, Illinois

SPECIALISTS IN SEWAGE LIFT STATIONS—THE COMPLETE LINE

CIRCLE 180 ON READER SERVICE CARD

New Product Briefs

Post-Tensioning Anchor

For prestressed concrete. Nails, not bolts, hold coil anchor and plate. Reusable rubber thimbles for shims. Use with 7-wire strand of $\frac{3}{8}$, $\frac{7}{16}$ or $\frac{1}{2}$-in. diameters. ATLAS SERVICE CORP., 14809 CALVERT ST., VAN NUYS, CALIF.

Plywood Flooring

Solidply has tongue and groove joints on all four edges, and two plies of solid wood. Sanded face surface. Regular sizes 4 x 8 ft, available in thicknesses to $2\frac{1}{4}$ in. INTERSTATE CONTAINER CORP., Box 790, RED BLUFF, CALIF.

Welding-Wire Feeder

Model C Wear-O-Matic. Feeds welding wire for semi-automatic open-arc hard surfacing. Provides 125 lb of continuous wire when Weld-Pak is used with the feeding unit. ALLOY RODS CO., PO Box 1828, YORK, PA.

Remote Pump Control

Floatless liquid level remote pump control. Low-voltage, low-energy circuit. Relay can be installed with motor control box at the pump location. Remote pump control can be installed underground or overhead. THE B/W CONTROLLER CORP., 2200 E. MAPLE, BIRMINGHAM, MICH.

Chain Saw Attachment

The Saw-Claw, a double pointed, spring loaded steel bar can be mounted on the chain guide bar of any direct drive chain saw to permit safe and rapid plunge cutting. GLEN FORD MFG. CO. INC., GLEN FORD, N. Y.

Tractor Loader

The TL-30 is the largest of the Allis Chalmers tractor loaders. It has a 10,500 lb. carrying capacity and a maximum lifting capacity of 25,000 lbs. Its diesel engine is rated at 184 hp. at 2,200 rpm. ALLIS-CHALMERS MFG. CO., MILWAUKEE 1, WIS.

Improved Caterpillar

The Cat D9G Tractor is claimed by its manufacturer to have a 15% increase in horsepower and to contain several improvements in power train, final drive and track roller frame design. Controlled turbo charging with after cooling of intake air is credited with pushing the flywheel horsepower rating to 385. CATERPILLAR, PEORIA, ILL.

Curing Compound

Concrete curing compound with additive to keep pigment in suspension longer. White pigment. W. R. MEADOWS, 26 KIMBALL ST., ELGIN, ILL.

Davey 600 c.f.m. Rotary Compressor operating 2 wagon drills in New York City.

*Perma-Vane** Blades keep DAVEY rotary compressors operating at top efficiency

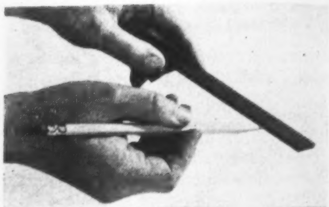
Perma-Vane blades, developed and used exclusively by Davey, eliminate the greatest single rotary compressor trouble. They are free from deterioration, delamination and breakage.

Davey Compressor Co. has recently removed Perma-Vane blades from several 600 c.f.m. rotary compressors that have each operated in excess of 15,000 hours.

In every machine, original blades show no appreciable wear. They have been returned to rotor grooves and are running daily.

Compare this with your own blade experience! See your Davey distributor—soon.

A-4423A



◀ After 16,832 hours, Perma-Vane Blade shows no deterioration, delamination, warping or curving. Davey blades are made of special heat-transmitting metal alloy. They are electrolytically hardened . . . self-lubrication surfaced.

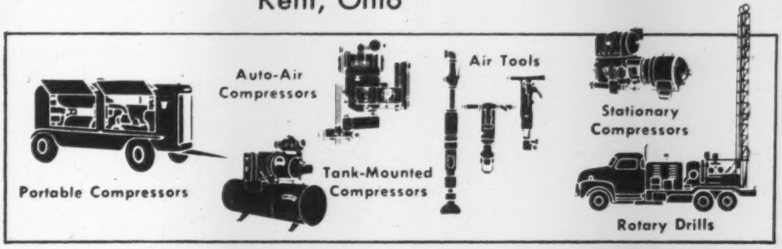
*Registered tradename. Perma-Vane Blades are covered by U.S. and British patents.

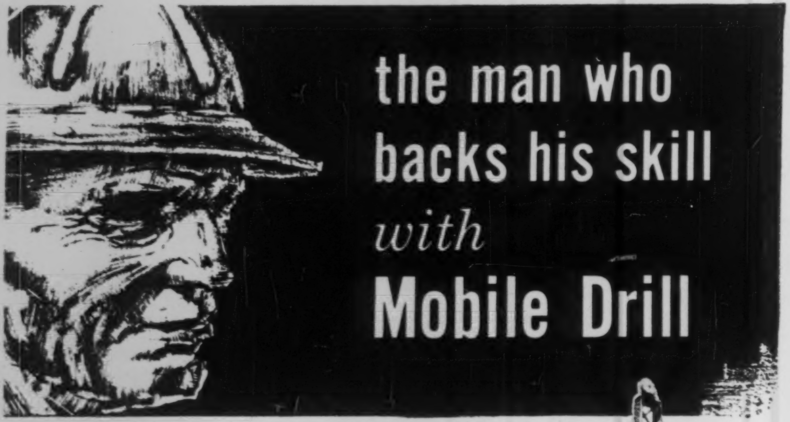
DAVEY COMPRESSOR CO.

Kent, Ohio

DAVEY

built to serve and endure



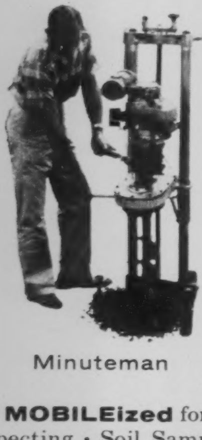


the man who
backs his skill
with
Mobile Drill

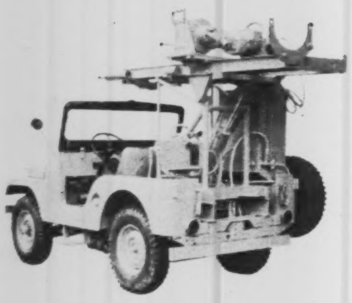
is MOBILEized
for *bigger profits!*

Mobile Drills are "on the go" everywhere . . . helping contractors prove out profitable jobs and *bid with assurance.* Whatever your drilling specialties, there's a dependable, field-proven Mobile Drill engineered especially for your range of operations. So MOBILEize for a head start on the bidding . . . a head start on *profits.*

Mobile B-52



Minuteman



Mobile B-40

Get MOBILEized for Contracting • Mineral and Aggregate Prospecting • Soil Sampling • Foundation Testing • Bridge Soundings • Core Drilling • Cathodic Protection • Water Well and Blast Hole Drilling • Utility and Pile Drilling

Write for new Mobile Drill Catalog No. 615

MOBILE DRILL

MOBILE DRILLING, INC.
Dept. 25 • 960 N. Pennsylvania St.
Indianapolis 4, Indiana

Telescoping Beam Shores

Aloca-Hico, adjustable-span aluminum beam with built in camber, for horizontal falsework. Weighs 67 lb. Spans 9 to 15 ft. No installation tools needed. HICO CORP. OF AMERICA, 120 BROADWAY, NEW YORK 5, N. Y.

Thawing Cable

Snow-Bar, for thawing walks and driveways of commercial and institutional buildings. Will withstand 300 F hot-pack asphalt installation. Available in 24-ft lengths at 400 watts and 400-ft lengths at 675 watts. Both 240 volts. EDWIN L. WIEGAND CO., 7500 THOMAS BLVD., PITTSBURGH 8, PA.

Magnetic Sweeper

Sweeper with an 8 ft. brush carries a 5 kw 120-volt dc generator to activate an electromagnet that will lift as much as 450 lbs. from a height of 4 in. The machine is said to be excellent for picking up nails, scrap iron, beer cans and the like from paved and unpaved roads. W. E. GRACE MFG. CO., 6015 S. LAMAR ST., DALLAS, TEXAS.

Chemical Soil Compaction

Chempact, a chemical aid to soil compaction, is claimed by its manufacturers to reduce the time needed to compact soil. One gallon of Chempact mixed with 1,000 gals. of water will treat from 5,000 to 10,000 sq ft depending on soil conditions. THE CENTRAL-REYNOLDS COMPANY, P. O. BOX 1203, FRESNO, CALIF.

Improved Crane Excavator

The 15-B Series 2 Crane Excavator is claimed by its manufacturer to have 29 major improvements on its predecessor. Produced as either a crawler or truck unit, it can be used as a crane, drag line, clam shell, back hoe or power shovel. It has an 18 ton capacity as a crane and will handle a $\frac{5}{8}$ cu yd dipper stick. BUCYRUS-ERIE CO., SOUTH MILWAUKEE, WISC.

Concrete Waterstop

Plastic waterstop for sealing concrete joints. Ryertex-Omicron PVC, with ribbed design for high bond and hollow center bulb for elasticity. In 50-ft coils of $\frac{3}{16}$ in. thickness at widths of 4, 6 and 8 in. JOSEPH T. RYERSON AND SON, INC., BOX 8000-A, CHICAGO 80, ILL.

Building Sealant

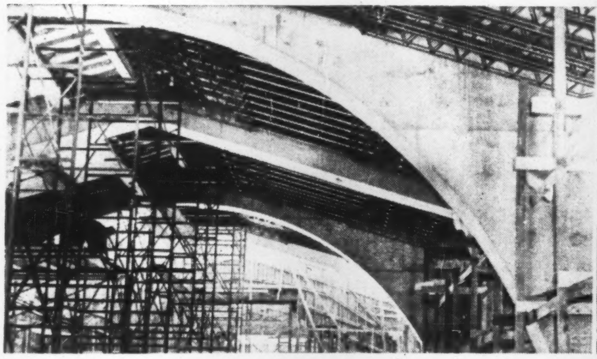
A silicone rubber sealant, Dow Corning 780, for wood, masonry, metals and ceramics. Resists heat and cold; retains flexibility and adhesion from —80F to 350 F. No premixing or catalyst. Supplied in cartridges ready for hand or air-operated guns. DEPT. WTR, DOW CORNING CORP., MIDLAND, MICH.

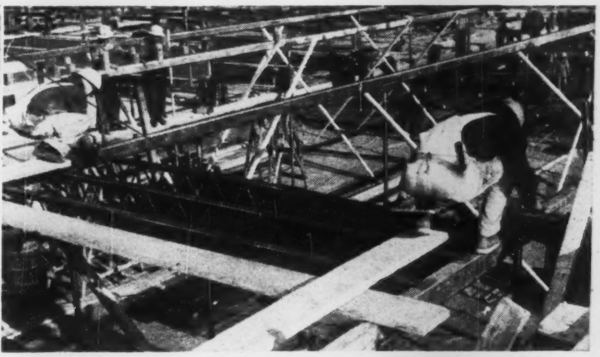
MODERN SHORING IDEAS

BY **REX® SPANALL**

MAKES SHORT WORK OF WIDE SPANS—versatile Rex-Spanall consists of two high-strength, telescopic members. Any number of members can be assembled for any desired length. This new Jacksonville, Florida, bank building shows how clear spans up to 20 feet for ten floors were speeded by Rex-Spanall.

ADAPTABLE REX-SPANALL IS IDEAL for all kinds of construction, as this pan system in the Jacksonville bank shows. You profit from faster completion of all types of work: flat slab; flat slab with drophead; beam and slab; structural steel frame; cantilever and prestressed or precast girder.





AUDITORIUM WORK WITH HIGH CEILINGS is made to order for Rex-Spanall, eliminating the complex of vertical timber shores otherwise required. This Los Angeles church indicates the simplicity Rex-Spanall brings to the job—the opening up of space below for simultaneous work by other tradesmen.

WHAT COULD BE EASIER when it comes to shoring? Note the greatly simplified shoring of this Milwaukee factory building both in horizontal *and* vertical shoring. Smaller shore setting crews are needed with Rex-Spanall, adding to the big total savings this modern, adjustable steel shoring method delivers on any job.

- Spanall features instant telescopic action—erects faster.
- Lightweight, easy to handle.
- Reduces man-hours substantially.
- Opens up job below for workmen and storage.
- Automatic camber compensation.
- Rent or buy—immediate delivery.

Let your Spanall distributor engineer your job for you

REX® SPANALL
Subsidiary of CHAIN Belt Company

REX-SPANALL
for buildings
for bridges
just printed

The most complete guidebook of modern horizontal steel shoring ever offered. New Rex-Spanall catalog gives complete information, illustrates all types of construction speeded by Rex-Spanall.

Rex-Spanall, Inc.
6427 West Capitol Drive
Milwaukee 16, Wis.
Export: Rex-Spanall International S.A., Hato Rey, Puerto Rico

Send new Rex-Spanall catalog to:

Name.......................................

Company....................................

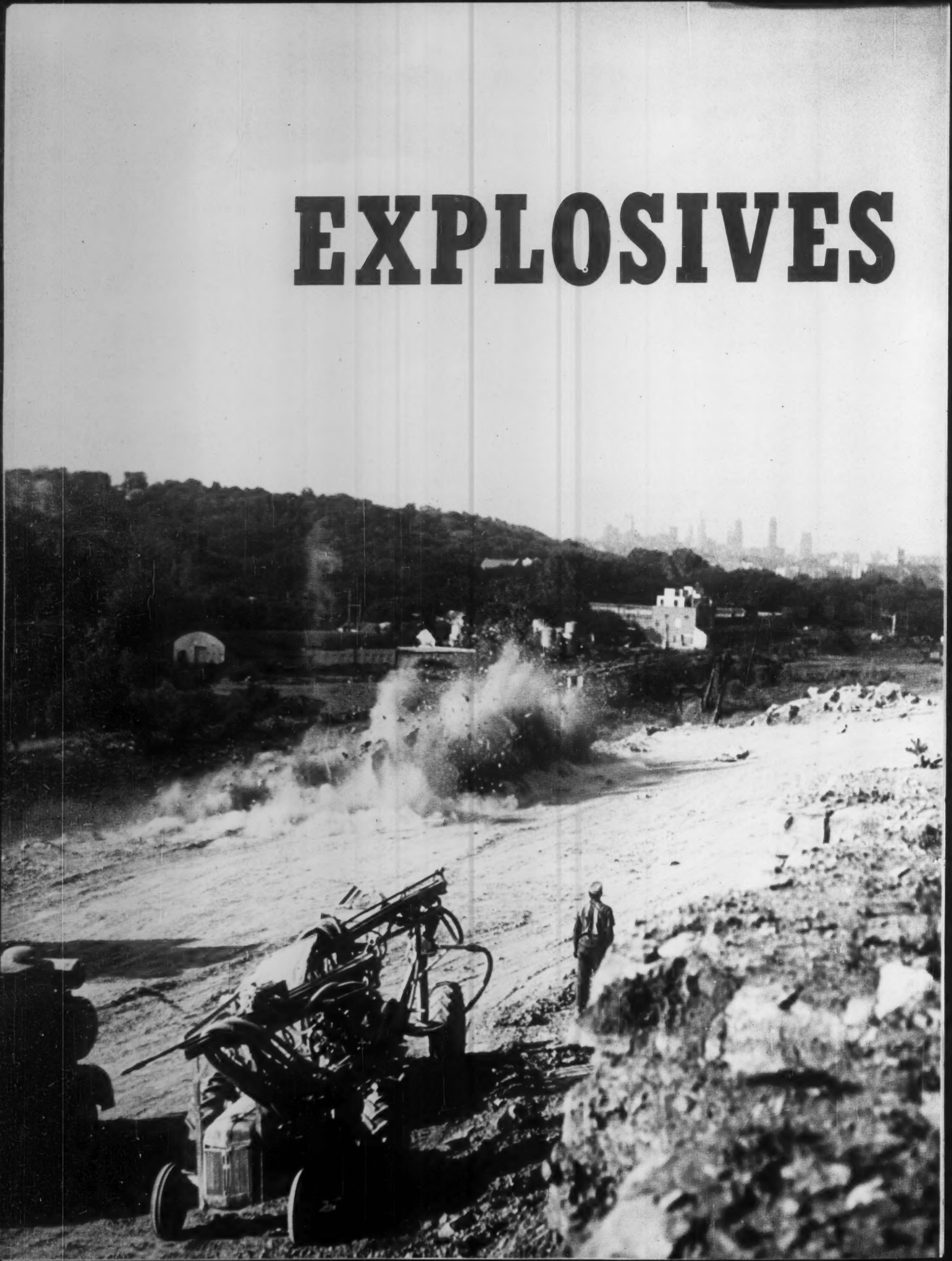
Address....................................

City.......................State...........

CIRCLE 183 ON READER SERVICE CARD

CIRCLE 184 ON READER SERVICE CARD→

EXPLOSIVES



ENERGY...

Have you checked into the many ways it can handle work that used to be done with mechanical energy . . . and do it cheaper, faster, more efficiently?

Lower TOTAL job costs can be your reward for examining ALL the ways in which explosives energy can work for you. For example, the J. A. Tobin Construction Company of Kansas City, Kansas did just this. On a section of the Turkey Creek Expressway, Interstate 35, there were no nearby homes or confining obstacles, so the objective was maximum breakage and production on every shot, together with efficient use of equipment. Gianite ammonium nitrate blasting agent was chosen for the task—low cost, ready to load, but with the wallop needed to do the job.

For this contractor, selection of the right primers, blasting agents, and blasting techniques meant more thorough and consistent breakage, more payload work out of each piece of his equipment, and minimum downtime from end to end of the job. This is just one example of efficient use of explosives energy. Others? . . . of course!

In coal stripping . . . with the help of the Atlas Representative, one operator discovered a way to eliminate almost one-half the total mechanical handling of overburden. He used explosives force to move rock directly to the spoil pile:

In open pit ore mining . . . production has been speeded, costs cut by "designing" the blast to create additional fragmentation, allowing much of the rock to bypass the primary crusher.

In quarrying . . . deliberate planning for thorough blasting (more than "just enough") saves more than its cost in reduced wear on crushers, wire rope, shovels—the whole gamut of equipment.

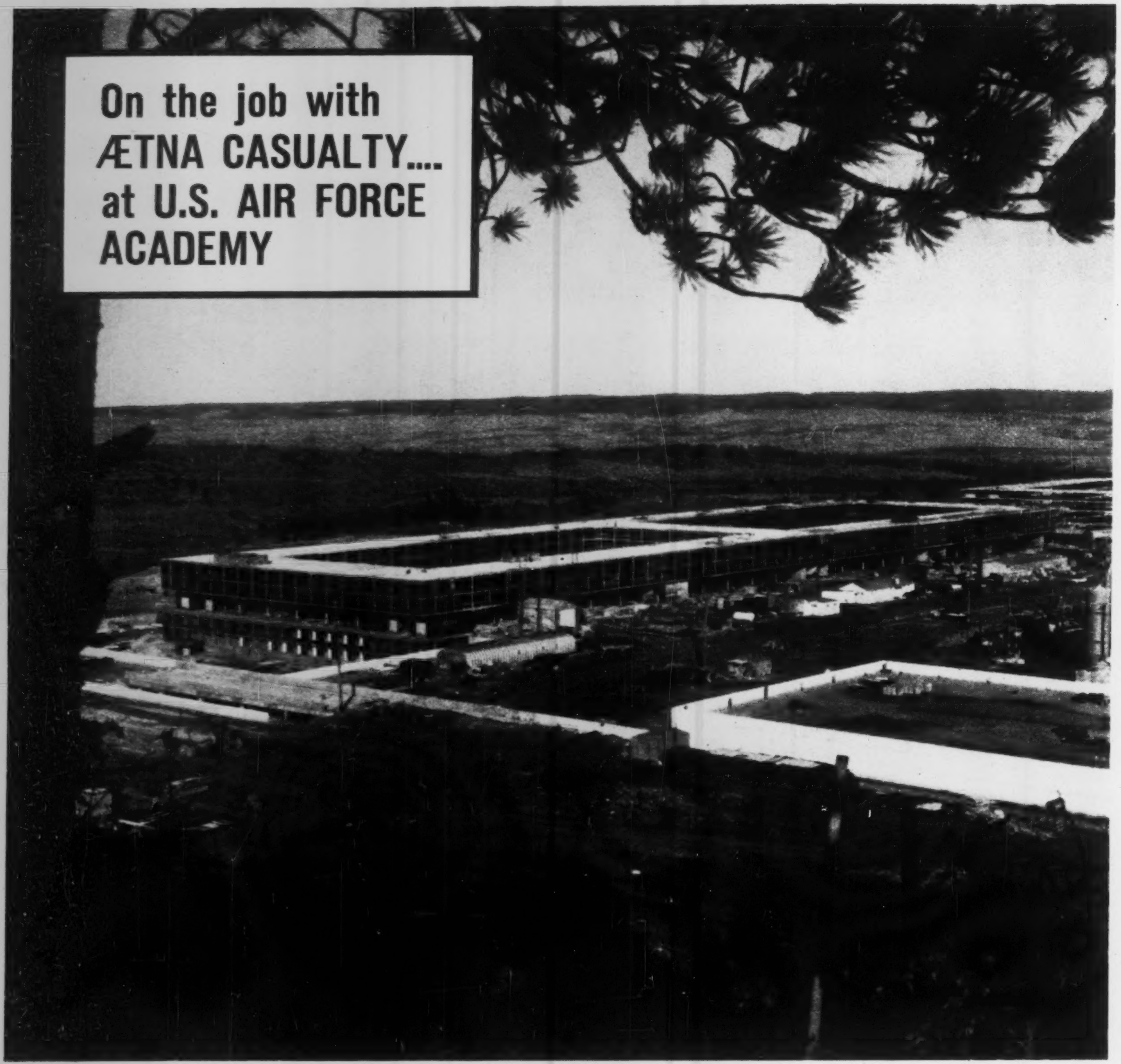
Efficiencies, and therefore savings, like these are available to you. Your Atlas Representative is both experienced and skilled in achieving these results in a wide variety of blasting conditions. There's no secret, unless it's knowing how to use the right combination of Atlas explosives, blasting agents (including *all* forms of ammonium nitrate), and blasting supplies for each job.

If you haven't checked your blasting methods lately, perhaps there's a new one Atlas can tell you about—the one that may be exactly the answer to help you reduce your overall costs. Look to Atlas' full line—the only full line in the industry. New, modern facilities are now in production at Joplin, Missouri to assure ready availability of all products. And to give you faster, more flexible local service, new distribution facilities are being established coast to coast. For assistance, call in your Atlas Representative, or write directly to:

ATLAS POWDER COMPANY
Explosives Division • Wilmington, Del.

ATLAS

ATLAS EXPLOSIVES



On the job with ÆTNA CASUALTY.... at U.S. AIR FORCE ACADEMY

The construction of the U.S. Air Force Academy, Colorado Springs, Colorado, was a $19,000,000 job. That's a big one . . . but not too large for Ætna Casualty to accommodate the bonding needs of the contractor.

When you choose a bonding company, make your choice on these qualities:

SERVICE: Ætna Casualty's offices in more than 70 principal cities coast-to-coast—plus thousands of experienced agents—assure you of quick and efficient service.

EXPERIENCE: Ætna Casualty's experts are carefully trained and thoroughly skilled. Their participation in many types of jobs gives them the knowledge needed to handle your bonding needs for every kind or size of operation.

CAPACITY: Ætna Casualty is able to handle the largest projects. Its qualifying limit as set by the Federal Government is in the highest group.

Choose your bonding company on these qualities and you'll choose

ÆTNA CASUALTY

Quality BONDING Service for contractors in every field.

Ætna Casualty and Surety Company • Hartford 15, Conn. • *Affiliated with* Ætna Life Insurance Company • Standard Fire Insurance Company • The Excelsior Life, Canada

CIRCLE 186 ON READER SERVICE CARD

Men and Jobs

Generals Hanmer, Sibley Get New Corps Positions

The Army Corps of Engineers has followed up the promotion of Lt. Gen. Walter K. Wilson, Jr. to Chief of the Corps with two more reassignments.

Maj. Gen. Stephen R. Hanmer moves into General Wilson's old slot as Commanding General, U. S. Army Engineering Center and Commandant, U. S. Army Engineer School, Fort Belvoir, Va. General Hanmer is now Deputy Chief of Engineers for Military Operations at the Office of Chief of Engineers in Washington, D. C. He will move to his new assignment, which carries no promotion, in August.

The position General Hanmer vacates will be filled by Brig. Gen. Alden K. Sibley, now serving as Deputy Chief of Staff for Logistics for the Military Assistance Advisory Group to Vietnam. The move will mean a promotion for General Sibley to major general.

New Boston Firm to Give Cost Estimating Service

Harold J. DeLamater and Carl T. Washburn, as partners, have organized Industrial Estimating Service at 35 Newberry St. Boston, Mass. They offer complete estimating and cost consultant service to architects, engineers, general contractors, government agencies and owners.

Mr. DeLamater in 25 years as a professional estimator has been chief estimator for such firms as Singmaster & Breyer, New York, and Anderson-Nichols & Co., Boston. He has been manager of the estimating department for Chemical-Construction Co. in New York and estimator for Lummus Co., New York.

Carl T. Washburn has chalked up 30 years of experience in design and construction of industrial plants and civil works. He is a licensed civil engineer in Massachusetts, New York, Indiana, Pennsylvania and Illinois.

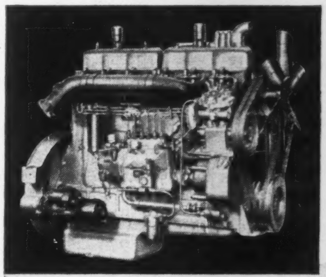
Briefs . . .

Business

T. A. Bedford has been elected president and director of Henry J. Kaiser Co. (Canada) Ltd. Since 1955, he has been in charge of engineering and construction project development. A 1931 Stanford University engineering graduate, Mr. Bedford joined Kaiser during the construction of Hoover Dam in 1932.

(*Please turn the page*)

MOST PRODUCTION with WAUKESHA POWER



A typical Waukesha medium six-cylinder Diesel. Other Diesel, gasoline, and gas models—up to 1200 hp.

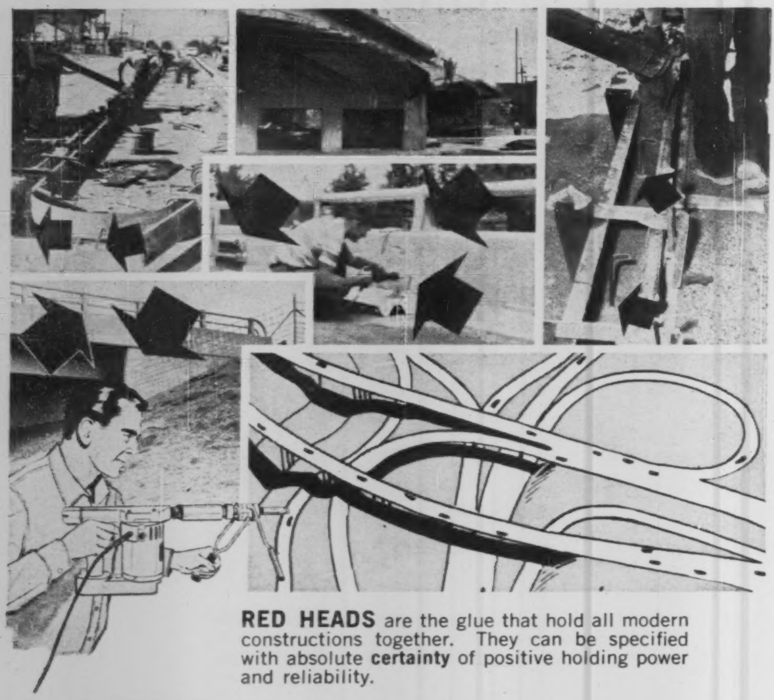
Specially adapted to general contractors' needs, Waukeshas handle every load demand easily and eagerly, and with power to spare. All Waukeshas are easy to start and operate; they will turn out more work, steadily and speedily. Economical to fuel and maintain. 50 to 1235 hp. Get the complete Waukesha performance story from your Waukesha distributor.

Waukesha also builds Engine-Generator Sets (ENGINATORS®) for all standard fuels . . . from 50 to 800 KW.

WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN
NEW YORK TULSA HUNTINGTON PARK, CALIF.
Factories—Waukesha, Wisconsin, and Clinton, Iowa 488-R

HIGHWAY ENGINEERS
SPECIFY
PHILLIPS **RED HEAD**® SELF-DRILLING CONCRETE ANCHORS
with
CERTAINTY!

Highway overpasses and interchanges create large requirements for a practical and reliable concrete anchoring system.



RED HEADS are the glue that hold all modern constructions together. They can be specified with absolute **certainty** of positive holding power and reliability.

PHILLIPS DRILL COMPANY
Department 76, Michigan City, Indiana

PHILLIPS RED HEAD CONCRETE ANCHOR

Write today for Pittsburgh Testing Laboratory Report on RED HEAD shear load and tensile load capacities.

CIRCLE 17 ON READER SERVICE CARD

146 SCREW JACKS
to choose from

- 29 Models. 4-way and Ratchet Head types. 10 to 24 tons capacity.
- 5 Planer Jacks
- 8 Journal Jacks
- 3 Reel Jacks
- Complete lines of push-pull & shoring jacks; Trench and Timber Braces.

WRITE FOR CAT. M-60

SIMPLEX
RE-MO-TROL UTIL-A-TOOL JACKS JENNY ROL-TOE

TEMPLETON, KENLY & CO. 2553 Gardner Road
Broadview, Illinois

GUNITE
Since 1915
CONCRETE
SAND AND CEMENT
"Placed by Air"
GUNITE
BLO-CRETE WET-CRETE
REFRACTORIES
LINING, ENCASING, FIREPROOFING, REPAIRING
SEND FOR OUR BULLETIN NO. 20

GUNITE CONCRETE & CONST. CO.
1301 WOODSWETHER RD., KANSAS CITY 5, MO.
2016 W. Walnut St., Chicago 12, Ill.
1004 Market St., St. Louis 1, Mo.
3206 Houston St., Houston 9, Texas
Los Angeles – Denver
New Orleans - Minneapolis

CIRCLE 18 ON READER SERVICE CARD

Norman P. Mason, U. S. Housing Administrator under the Eisenhower Administration, and **Thomas H. Lenagh,** of the Ford Foundation, have been elected directors of the Empire National Corp. Mr. Mason has also been made chairman of the board of American International Housing Corp., a subsidiary of Empire National formed to produce prefabricated and shell houses.

August W. Compton of Indianapolis has been named president of Leigh Fisher Associates, Inc., an airport consulting firm with headquarters in San Francisco. He was formerly vice president of Clyde E. Williams & Associates, Inc., a consulting engineering firm of Indianapolis and Miami.

Hunter Construction Co. of Youngstown, Ohio, has promoted **Elroy G. Denz** to vice president in charge of production. He has been chief engineer since 1957.

Public Works

Stewart P. Crum, a member of the Federal Power Commission staff for nearly 21 years, has been appointed chief of the Division of River Basins in the Bureau of Power. He succeeds **Frank L. Weaver,** who has retired after 27 years in government service.

Roger F. Nusbaum has been promoted to assistant state highway engineer in Illinois. Chicago expressway engineer for the last six years, he will be in charge of the Chicago metropolitan area and northeastern Illinois.

Edwin G. Avery, public works commissioner of Cranston, R. I., has been elected president of the Rhode Island Highway Association. He will succeed **Ephraim Langlois.**

The New York City Board of Water Supply has named **Leroy Ericson** deputy engineer in charge of design, subject to confirmation by the state civil service board. He succeeds **George Spann,** who has retired.

Lawrence W. Whitneck has been appointed chief harbor engineer of the Port of Los Angeles to succeed the late **Adm. Edward V. Dockweiler.** The Port's administrative engineer for the last two years, he will take over the $18,000-a-year post immediately, pending a civil service examination.

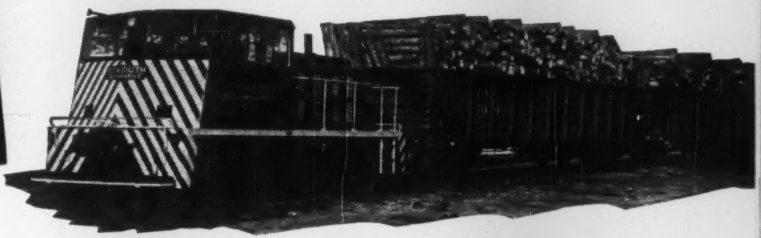
The City of Philadelphia has named **John L. Evans** city architect. Formerly associated with the architectural firm of Harbeson, Hough, Livingston and Larson, he will supervise the design of all new municipal installations.

E. P. Ericson has been promoted to assistant general manager of the Tennessee Valley Authority, succeeding **Louis J. Van Mol,** who has been promoted to general manager.

PLYMOUTH® LOCOMOTIVES with Torqomotive Drive

3 TO 80 TONS

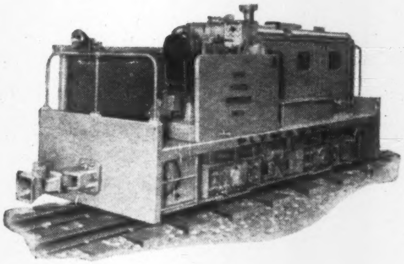
Industry's Smoothest Switchers



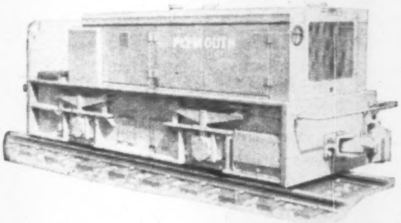
SINCE 1914 Plymouth Locomotives have been used for heavy hauling and switching jobs. They have proven themselves in year after year service with rock bottom economy, maximum availability, minimum down time. Pictured above is the new WDT Cab-in-front model, 40 tons, in service hauling pulpwood. Both the MDT and WDT are available in this model or in the standard models shown below.

Here's the lineup of well-known Plymouth power in models from 3 to 80 tons . . . narrow or standard gauge . . . Gasoline or Diesel . . . mechanical or Torqomotive Drive . . . Diesel-Electrics. Records of users show Plymouth's economy, efficiency, dependability. Find out how these profit characteristics can improve your operation and cut costs.

PLYMOUTH LOCOMOTIVE WORKS
Division of The Fate-Root-Heath Company
Dept. A-4 Plymouth, Ohio

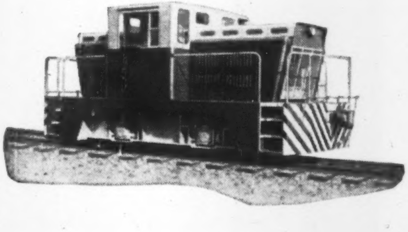


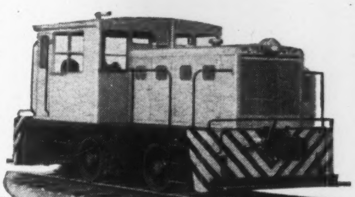
J SERIES Mine-O-Motive, 15 to 25 tons. Diesel powered with exhaust conditioner, Torqomotive Drive. Approved under Schedule #24.



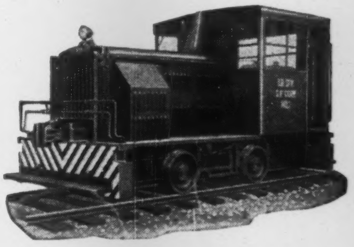
DMS SERIES Mine-O-Motive, 8, 10 or 12 tons. Diesel powered with shaft drive to both axles, full power shifting. Approved under Schedule #24.

CR SERIES, 40 to 60 tons. Diesel powered with shaft drive to both axles, full power shifting, Torqomotive Drive. Speeds to 35 MPH.

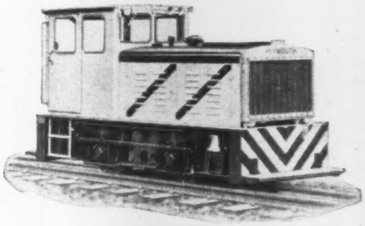




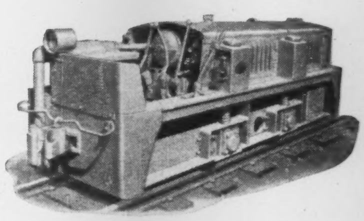
M SERIES, 25, 30, 35 or 40 tons, Diesel or gasoline, mechanical or Torqomotive Drive. This is the standard model, rear cab.



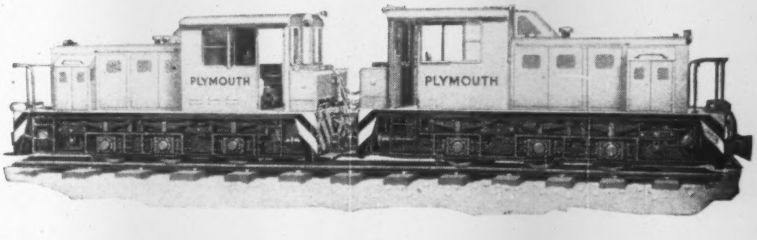
J SERIES, 12, 14, 16, 18 or 20 tons, Diesel or gasoline, mechanical or Torqomotive Drive. Available on 4 or 6 wheels.



D SERIES, 8, 10 or 12 tons, Diesel or gasoline, mechanical or Torqomotive Drive. Cast or Welded Frame.



F SERIES, 5, 6, or 7 tons, available as mine type (illustrated) or cab type. Torqomotive Drive, short wheelbase.



PLYMOUTH TANDEMS—M or W Series 50 to 80 tons. The M or W Series can be built for tandem, single control operation, up to 80 tons on either 8 or 12 wheels. Each locomotive can also be operated individually.

**Torqomotive Drive; Plymouth transmission coupled to hydraulic torque-converter.*

PLYMOUTH® LOCOMOTIVES

PLYMOUTH LOCOMOTIVE WORKS

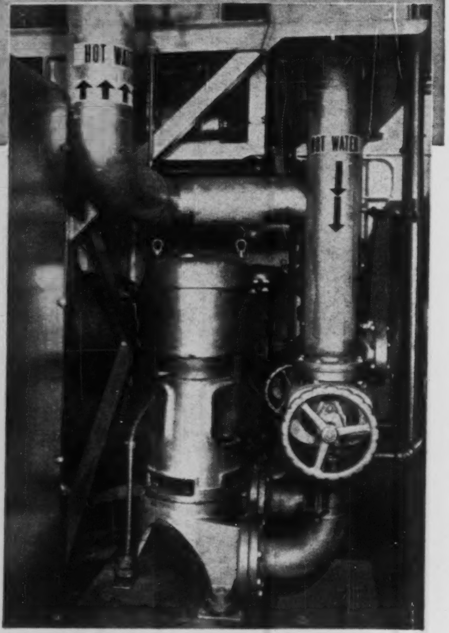
CIRCLE 189 ON READER SERVICE CARD

SPECIFY THE weil

VKY

Space Saving

VERTICAL
CIRCULATING
PUMP



for

CIRCULATING •
HOT WATER
FOR HEATING

CIRCULATING •
CHILLED WATER
FOR COOLING

CIRCULATING •
CONDENSER WATER

BOOSTER •
PUMP SERVICE

Capacities to •
750 GPM.

QUIET OPERATING
EFFICIENT PERFORMANCE

An all ball bearing pump designed for continuous operation!

THE weil
VKY pump . . .

The highly efficient VKY PUMP requires only one shaft seal. Supply and discharge piping are on one side only. All operating parts may be removed without disturbing any piping connections. Motor is a standard frame NEMA C mount with standard shaft extension. Vibration is eliminated by three rubber vibration eliminator mounts. Noise transmission is reduced to an absolute minimum.

SEND FOR BULLETIN VKY-6900.

weil PUMP COMPANY

1528 N. Fremont Street, Chicago 22, Illinois

Obituaries

Carter Page, 56, nationally known authority on water resources. Mr. Page retired last November from his position as Chief of the Planning Division, Civil Works, in the Office of the Chief of Army Engineers after 29 years in the Corps, including four years of active duty in World War II. As chief of planning for civil works, he had been active since 1954 in the planning of flood control, navigation and related river basin improvements.

Carroll L. Mann, 84, former head of the department of civil engineering of North Carolina State College, Raleigh, N. C., and for 25 years secretary of the North Carolina State Board of Registration for Engineers and Land Surveyors. He retired from college in 1948.

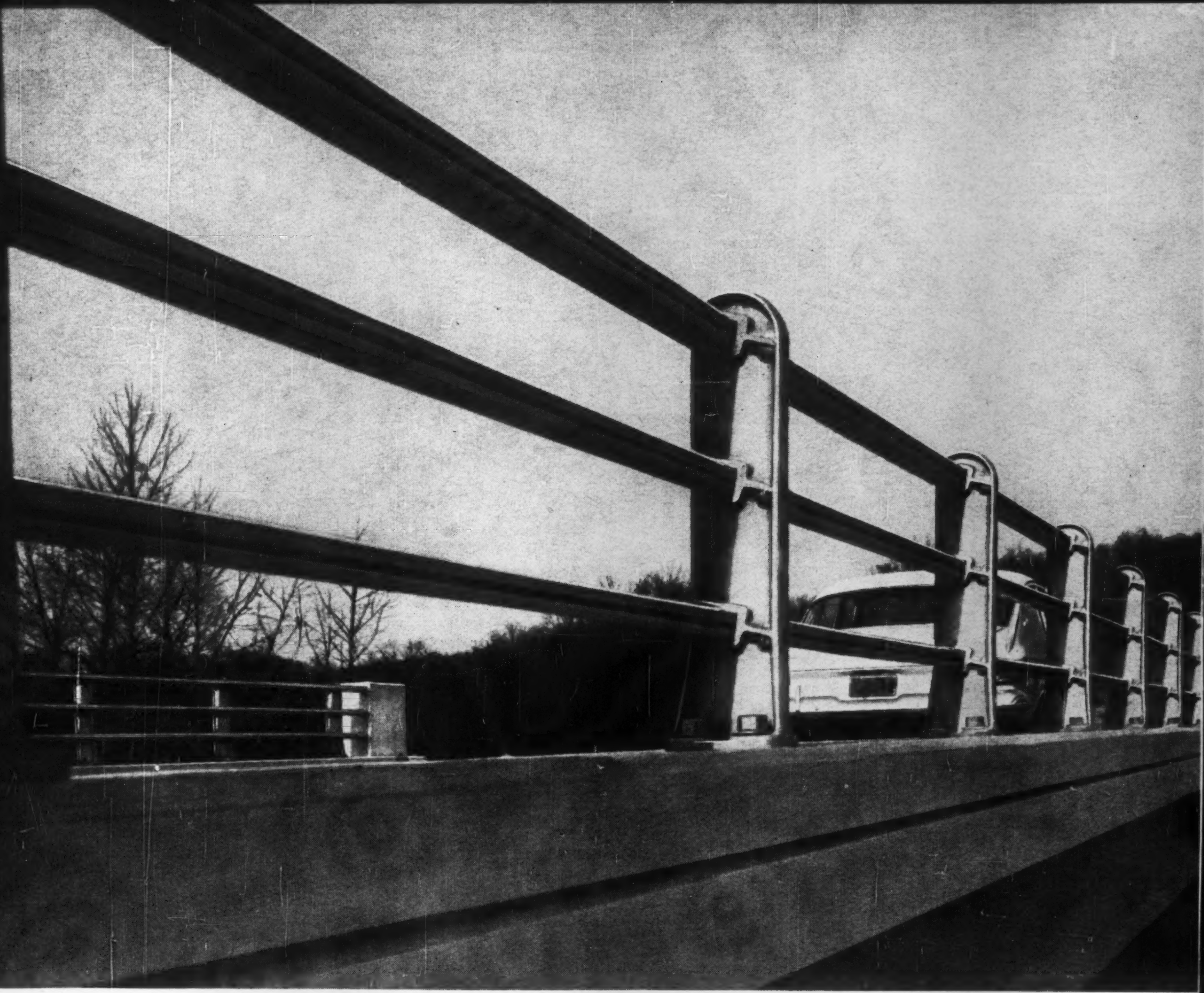
Jay F. Krakauer, 67, until a few months ago senior engineer with Steinman, Boynton, Gronquist and London, consulting bridge engineers of New York City. He had also been a member of the Board of Engineering Examiners of the New York Municipal Civil Service Commission. He received his degree from New York University in 1915.

Guy Panero, 69, consulting engineer who headed an engineering company bearing his name and was also president of Panero-Weidlinger, Salvadori, consulting engineers of Paris, Rome and Lausanne, Switzerland. He specialized in electrical, heating, air-conditioning, ventilation, water supply and fire protection systems.

Frederick Runyon, 86, senior partner in the Newark engineering firm of Runyon & Carey, which specializes in public works. He was a former president of the New Jersey State Board of Professional Engineers and Land Surveyors.

Harold F. McLean, 78, Canadian construction leader who founded the Dominion Construction Corp., the Grenville Crushed Co., Ltd., H. F. McLean, Ltd., and the Seaboard Construction Co. His companies built the Atitibi Canyon Power Development, the Flin Flon Railway, the Temiskaming and Northern Ontario Railway and the Montreal Aqueduct.

Harry Pembleton, retired head of the Birmingham, Ala., architectural firm of Pembleton and Mims. He started his career in New York City, going from there to Puerto Rico as an architect for the U.S. government to work on the capital and other government buildings. He opened his own office in 1938.



Galvanized for years of service

BETHLEHEM PERFECT VISION BRIDGE RAILING

When you install Bethlehem Perfect Vision Bridge Railing, you can count on years of service, free from unsightly corrosion. Galvanized to meet all ASTM specifications, Bethlehem Bridge Rail will, under normal conditions, last as long as the bridge itself. The posts are ASTM A-47 malleable iron castings.

Send for our free booklet on Perfect Vision Bridge Rail. It gives full specifications and describes test data in detail. Get in touch with the nearest Bethlehem sales office, or write directly to us at Bethlehem, Pa.

IT'S THE RAILING WITH EYE APPEAL

- **Neat, trim appearance . . . unobstructed view.**
- **Sturdy protection—meets ASHO strength specifications.**
- **Easy installation . . . delivered ready to install . . . just a few nuts to tighten.**
- **Damaged rails easily replaced.**
- **Variable post spacing.**
- **Four styles available—one- and two-rail for parapets; three- and four-rail for curb and sidewalks.**

Galvanized Steel

for Strength
. . . Economy
. . . Versatility

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
Export Sales: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

CIRCLE 191 ON READER SERVICE CARD

201
LeTOURNEAU-WESTINGHOUSE

Haulpak® is delivering at LOWEST NET COST

Acceptance of the LW Haulpak, first all-new truck in a quarter-century, has been fast. Perhaps the best explanation for this wide-spread acceptance comes from *owners** themselves. One puts it this way: "We needed trucks large and rugged enough to handle big loads, yet fast and maneuverable enough to do it *economically*. And we believe that with Haulpak, *we have it!*" Another says: "Haulpaks have cut our truck maintenance costs *almost in half*."

There's a tip for *you* in this owner's comment: "After a trip by three officials of our company to see these units in action, *we chose Haulpak.*" Let us arrange a demonstration for you. See first-hand how *you* can get extra tons per hour, at lowest net cost per ton-mile, with LW Haulpaks. 5 end-dump sizes: 22 to 60 tons, up to 550 hp.

▲ Owned 3 . . .
bought 8 more!

Enthusiasm for Haulpak trucks runs high with this large U.S. cement producer. The firm put 3 LeTourneau-Westinghouse 32-ton Haulpaks to work on 7,100-ft hauls (above). Adverse grades averaged 1.3% . . . max. was 400 ft of 5% adverse grade. Haulpaks completed cycles in an average of 8.58 minutes. Production per 50-minute hour averaged 179 tons per machine. This steady output, coupled with low-maintenance performance, led to repeat orders for 3 more 32-ton Haulpaks . . . then *5 more* for another pit location . . . making a total of 11 Haulpaks to date.

*Names on request

HP-2387-DCJ-2r

LW

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

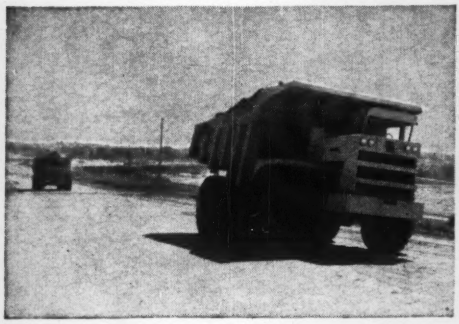
A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

CIRCLE 192 ON READER SERVICE CARD

In NEBRASKA

Hauling 32-ton loads of overburden to dump area, LeTourneau-Westinghouse Haulpaks cruise along well-maintained roads at speeds to 38.8 mph. Safe? You bet! There's a total of 5,148 sq in. braking surface on 32-ton Haulpak . . . *four times* the braking area of most comparable-capacity trucks.



In INDIANA

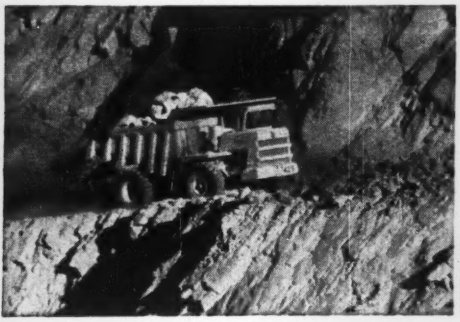
27-ton Haulpak highballs over typical quarry road. Hydrair® suspension cushions travel shocks . . . keeps load riding level, reduces spillage during high-speed haul. Center of gravity is *low*, because about 6 tons of material are carried *below* normal truck floorline in Haulpak's deep V-body.

In UTAH

Here's the big 550-hp, 60-ton Haulpak in action. This latest addition to LW line, carries almost *twice* its own weight in payload capacity! Weighs approx 66,000 lbs, carries 120,000-lb payload. Reason: high-tensile-strength steels, nearly 3 times stronger, ⅓ lighter than in ordinary trucks.

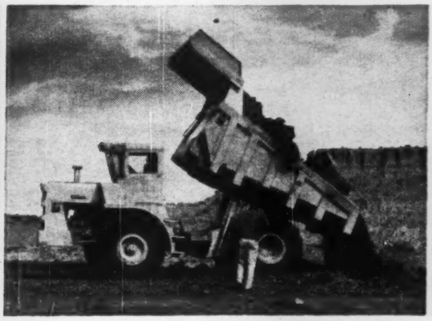
In CALIFORNIA

Heaped with rock, 32-ton Haulpak shows plenty of power and pep as it climbs grade. Pit-to-plant hauls are long . . . grades, steep and winding. Talking about acceleration and power, another LW owner reports: "Our Haulpaks come out of the pit in a higher gear, and at a faster rate of speed, than any unit we are familiar with."



In NEW MEXICO

Over-the-edge dumping minimizes clean-up on this waste bank. Notice how edge of bowl swings low, well back of rear wheels, as the body starts to raise. Dump action is fast, too! Twin hydraulic rams lift the body to full dump-angle in approx 16 seconds. LeTourneau-Westinghouse Haulpak shown below is 27-ton size.



In PENNSYLVANIA

Stripping contractor owns 4 of these LW 32-ton Haulpaks. Comparing them with conventional 22-ton trucks, contractor says: "Haulpak's short turn-around, plus high hauling speeds, mean that each of these 32-ton trucks gains one complete round trip in every seven on hauls of average length. Ours vary from 800 to 2500 feet."

PER TON-MILE for owners everywhere

In ITALY

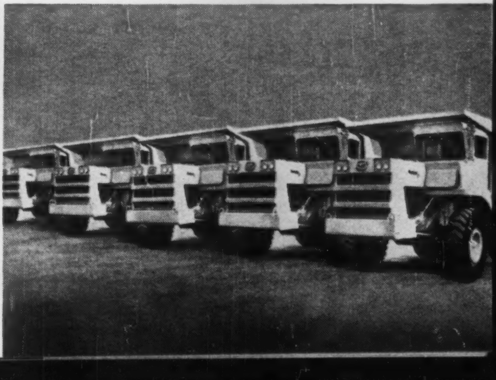
To level site for steel mill expansion, dirt and rock are hauled nearly 2 miles and dumped into the sea. Ten LW 32-ton Haulpaks haul up 6% grades, around blind corners at buildings, plant gates, and over city streets. Each machine averages 22 to 23 trips per 8-hour shift.

In NEVADA

This 60-ton Haulpak works around the clock, 7 days a week, on a mile-long haul. Average adverse grade: 7%. It's a grueling assignment, but LW Haulpak has the matched power, speed, and structural strength it takes to beat tough work schedules. Haulpak's production: 1668 tons per 7-hour shift!

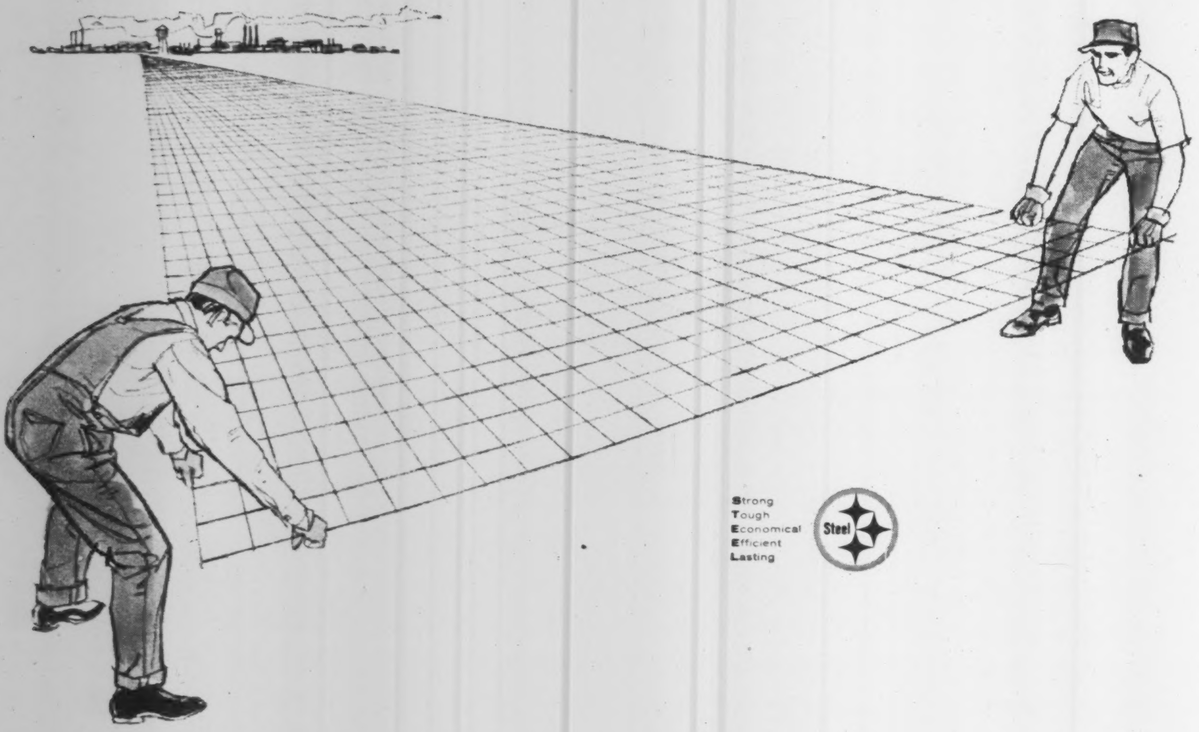
Destination: LIBERIA

With 5 LW Haulpaks already at work, 7 *more* are on their way to a Liberian mine. Here's part of the latest 27-ton Haulpak fleet being readied for overseas shipment. In addition, the African mining firm has 2 LW 440 graders, and 9 C Tournapulls® building a railroad service line.



SHEFFIELD
Welded Wire Fabric

The steel backbone for every concrete slab—sidewalks, super highways, airport runways, bridges, roof and floor slabs and pre-cast structures.



Strong
Tough
Economical
Efficient
Lasting

Steel

Strategic Locations and Prompt Personal Service Assure

On-Schedule Shipments

Sheffield has the production — on the world's fastest and most modern rod mill — and a stepped-up operation at all plants. Sheffield has the plant locations — placed right for on-time shipment anywhere in the mid-western, Gulf coast or western regions of America. Sheffield has the product — Welded Wire Fabric, quality controlled from furnace to finish.

Tell us when. We'll have it there on schedule in any quantity you need. Sheffield Welded Wire is available in sizes from 16 gauge to 7/0 gauge and every standard rectangular spacing. All are made in accordance with A.S.T.M. specifications. We'd like to tell you more. Write or call your nearest Sheffield office for full information. **Sheffield plants: Houston • Kansas City • Tulsa**

ARMCO Sheffield Division

Books

Why Failures Happen

FOUNDATION FAILURES—By C. Szechy. 146 pages. Concrete Publications, Ltd., 14 Dartmouth St., London S.W. 1, England. $5.

By Jacob Feld

Translated from the Hungarian, these lectures on foundation failures make an unusual book, because of the frank description of how, why and when structures are abandoned or require extensive and expensive reconstruction due to foundation deficiencies. The author is a professor of foundation engineering, University of Civil Engineering and Architecture, Budapest.

Of the 72 examples of foundation troubles described, some two-thirds are of Hungarian structures, and all are very well documented with subsoil profiles, settlement readings over extended periods and careful analysis of the cause of failure. Most of the other examples are taken from the literature, and here the author is not so accurate. For example, the material taken from one of my papers (Example 22.23) is considerably distorted from the facts as published in the U. S. However, the lesson is well illustrated, even if the conditions as described did not occur.

Prof. Szechy catalogs foundation failures under these general causes:

1. Inadequate investigation of the site (eight examples describe six types of trouble resulting).
2. Unsuitable types of structures and foundations (25 examples describe 14 different design errors).
3. Defects and failures due to defective execution (22 examples describe 19 different types of omission).
4. Failure date to external influences (17 examples of 16 forms of natural and artificial modification of the subsoil after a successful construction operation).

The American reader will disagree with the third classification unless he realizes that in European construction technique the contractor's execution includes many phases that we call design and that we therefore could include in the second classification.

Some of the types of failure described could be further enriched by information from the technical literature of the U.S., Great Britain and Canada, from which the author only cited five, three and two failures, respectively. On the other hand, most of the descriptions of failures included have never previously been available in English.

The text is illustrated by 102 diagrams and 20 figures, very clearly presented and giving valuable information in addition to the descriptions.

Much can be gained from such descriptions of the nature and cause of structural failures. I hope that other engineers will follow his example in presenting such data for the benefit of the entire profession.

***Mr. Feld**, New York City consulting engineer, is an authority on foundation design and construction. He is also noted for his studies of construction failures.*

Compleat Steel Builder

BUILDING WITH STEEL—by Don A. Halperin. 254 pages. American Technical Society, Chicago, Ill. $6.

This volume covers all phases of steel construction—from design and detailing through fabrication and erection. The fourteen chapters are well illustrated with photographs, diagrams, sketches and detail drawings.

The design sections, though elementary, go far enough to introduce the reader to plastic theory (in a chapter on rigid frames). Other chapters explain the design of beams, columns, plate girders, trusses, and riveted and welded connections.

Chapters on shop and field practice discuss the practical arts of steel construction. And a chapter on prefabricated components—curtain walls, interior partitions, doors and windows—brings the reader up to date in the field of modern steel construction.

Advanced Stress Analysis

STATICALLY INDETERMINATE STRUCTURAL ANALYSIS—By R. L. Sanks. 602 pages. Ronald Press Co., New York, N. Y. $10.

Professor Sanks, chairman of the Department of Civil Engineering at Gonzaga University, has covered the traditional ground of indeterminate structural analysis with emphasis on method rather than problems. He sticks with one method (e.g., virtual work) for several chapters, employing it to solve deflections, reactions and internal stresses of beams and trusses before taking up other methods. The author maintains that this strategy enables development of the theory more deliberately and more rigorously than does a problem-oriented approach. In his words, "It is better to know three, or

(*Books continued p. 196*)

imagination...
PLUS PRACTICAL EXPERIENCE

turning new and existing raw materials into new products for the construction industry

Practical knowledge of construction and civil engineering, combined with a keen understanding of research and development, enables The Cerand Corporation to provide a fresh approach to product and market development for the construction industry. Cerand focuses the time and talents of its large technical staff on the problem of bringing together the basic manufacturing industry and the vast markets that exist for new products and materials.

Cerand can help your firm:

- Develop new products for the construction fields.
- Gain new construction markets for your raw materials.
- Solve complex civil engineering problems.

For specific examples of how Cerand can help your firm, send for our definitive brochure.

the cerand corporation

Product and market development for the construction industries

Dept. 31

285 Columbus Avenue, Boston 16, Mass.

ANOTHER PROBLEM SOLVED BY SPENCER, WHITE & PRENTIS

ALTERNATE BRACING, NO WALERS

Unique way to use timber sheeting for bank support and back form proves both practical and economical

Project: Military Park Underground Parking Garage, Newark, N. J.
General Contractor: Terminal Construction Corp., Wood-Ridge, N. J.
Consulting Engineers: Weiskopf & Pickworth, New York City
Architects and Engineers: Frank Grad & Sons, Newark, N. J.

In the above-pictured installation of horizontal wood sheeting, the braces are positioned at every second soldier beam. Ordinarily such alternate bracing would require walers; instead, this special design successfully substituted a system of tensioned struts and angles.

Without any encumbering walers, the sheeting served perfectly as a back form—after it had supported a trench (which was needed to relocate an existing sewer line) and had also maintained the street as the contractor excavated 36 ft. to subgrade for the main structure.

The special plan—by Spencer, White and Prentis—proved both practical and economical. Can we be of service to you?

CATALOG ON REQUEST

Spencer, White & Prentis INC.

FOUNDATIONS · PILING · UNDERPINNING · SHORING · COFFERDAMS · SPECIAL SERVICES

10 EAST 40th STREET, NEW YORK 16, N. Y.
DETROIT: 2033 PARK AVE. • CHICAGO: 221 NORTH LaSALLE ST. • WASHINGTON, D. C.: TOWER BLDG.

two, or even one method well than to be superficially acquainted with many."

Though Professor Sanks concentrates on the three basic methods of moment area, virtual work and moment distribution, he explains and offers mathematical proofs of the classical theorems.

There are individual chapters dealing with Castigliano's theorems, column analogy, slope deflection, elastic center and double integration. The opening chapters review elementary sattical analysis, bending moment and shear diagrams, as well as calculation of areas and centroids.

One defect of the book, which weighs against its value as a reference for practicing engineers, is the author's failure to give the theorems and techniques of plastic analysis more than footnote mention.

Analysis of Structures

Introduction to Structural Mechanics—By Paul Andersen and Gene M. Nordby. 340 pages. Ronald Press Co., New York, N. Y. $9.50.

This volume contains a rigorous treatment of elementary structural analysis—from statics to statically indeterminate structures. The material is divided into two categories: the general theory of statics and its special applications to common structures (e.g., roof trusses, railroad and highway bridges).

Subjects covered include graphic statics, moving loads and influence lines, and three-hinged arches. There is a long chapter on analysis of three-dimensional frames.

The final chapter presents approximate methods of solving bents, redundant trusses and other statically indeterminate structures.

Analysis of Decisions

Engineering Economy—By William T. Morris. 506 pages. Richard D. Irwin, Inc., Homewood, Ill. $10.50.

Changes in business management concepts have come about in recent years due to advances in operations research, management science and decision theory. These ideas must be considered in any study of modern engineering economy. Realizing this, the author has developed a book that presents engineering economy within the larger context of the analysis of management decisions.

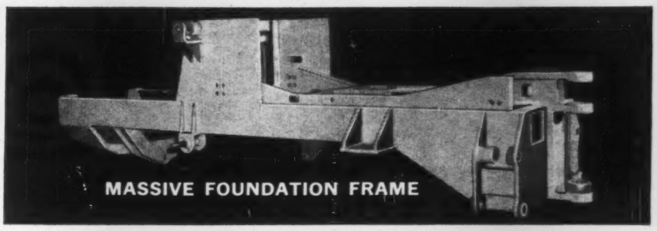
Some previous acquaintanceship with economics, accounting and probability theory is assumed. But these subjects

(*Books continued p. 198*)

CHICAGO CONTRACTOR ADDS 5th "DYNAHOE" TO FLEET

SAYS KILBAR ELECTRIC:

"DYNAHOE FAR EXCELS ANYTHING WE'VE EVER SEEN OR OWNED"



MASSIVE FOUNDATION FRAME

● Like other "DYNAHOE" fleet owners, Kilbar Electric Company, Chicago, Illinois, proves its acceptance of Hy-Dynamic's completely integrated Loader-Tractor-Backhoe unit by placing still another "DYNAHOE" order. Four other Kilbar "DYNAHOE" units have already proved to be real profit makers in the field.

Kilbar has found that "DYNAHOE" construction, strength, power, speed, performance and reliability are prime factors which so clearly distinguish the "DYNAHOE" from all standard tractors to which loader and backhoe attachments have merely been added.

Kilbar considers the massive "DYNAHOE" foundation frame fundamental to its performance—to its freedom from breakdowns—to its continuous dependability. Only this design can provide the strength and stamina so vital to successful Backhoe performance.

Basic "DYNAHOE" Features Include:

● Exclusive "Integrated Design" ● Extremely Heavy Duty Construction ● New Operating Advantages ● Oversize Pins and Bushings Throughout ● Fast Swinging and Digging ● Power Steering ● 3-Speed Transmission with Torque Converter and Power Shift Forward and Reverse ● Extra Heavy Duty Buckets ● Correctly Balanced Weight Distribution ● Heavy Planetary Rear Axle ● 65 Net H.P., 6 Cylinder Engine

The "DYNAHOE" Loader-Tractor-Backhoe is distributed by leading Construction Equipment Distributors. For further details on "DYNAHOE" and the name of your nearest Distributor write:

DYNAHOE

MANUFACTURED BY
THE HY-DYNAMIC CO.
419 SKOKIE HIGHWAY, LAKE BLUFF, ILLINOIS
CEdar, 4-5400

NEW RICHMOND HANDBOOK NOW AVAILABLE!

Every minute of the day... a Richmond product is saving time and money on every kind of concrete construction.

Richmond's NEW Handbook has also been designed to help save you time and money!

50
RICHMOND
SCREW ANCHOR CO., INC.

NEW HANDBOOK CONTAINS, UNDER ONE COVER, 12 SEPARATE MULTI-PAGED BULLETINS FULLY DESCRIBING RICHMOND'S MORE THAN 400 FORM-TYS, ANCHORS, INSERTS, ACCESSORIES AND SUPPORTS FOR CONCRETE CONSTRUCTION.

More than a year and a half in preparation, our NEW Handbook is now completed and ready for distribution. This Handbook, which we believe to be the most comprehensive ever to be compiled, has been prepared in twelve sections, each dealing with a Richmond product category or a phase of concrete construction. Whatever your concreting needs, you will find a Richmond product in this Handbook which will be completely suitable for your particular application.

There are more than 400 Richmond-engineered products, developed through 50 years of experience, listed in the Bulletins of our NEW Handbook . . . all designed to help you save time and money safely in every kind of concrete construction.

50 YEARS OF PROGRESS **1911-1961**

Write for your FREE copy of Richmond's NEW Handbook, or help with any specific concreting problem. There are more than 25 Richmond Field Engineers, in addition to a service network of more than 500 Richmond Dealers, always ready to help you.

Richmond
SCREW ANCHOR CO., INC.
INSIST ON RICHMOND
. . . AND BE SURE IT'S RICHMOND

MAIN OFFICE: 816-838 LIBERTY AVENUE, BROOKLYN 8, N. Y.
SALES OFFICES, PLANTS & WAREHOUSES: FT. WORTH, TEX.—ATLANTA, GA.—LAUREL, MD.
ST. JOSEPH, MO.—WALTHAM, MASS. **IN CANADA:** ACROW-RICHMOND, ORANGEVILLE, ONT.

are reviewed briefly to refresh the reader's memory.

The book is based on this premise: "In making decisions, it is best to go as far as is technically or economically feasible with analysis, then appeal to judgment and experience."

In line with this premise, the author classifies decisions in accordance with the information available—decisions under certainty, under risk, under uncertainty, under pressure. He then gives procedures to follow in each case.

The book also discusses such important factors in engineering economy as taxes, replacement policy, inventory management, the bidding problem, procurement strategy and economics of automation. And in the appendix, it explains how to make interest calculations and presents interest tables.

Community Planning

THE COMMUNITY BUILDERS HANDBOOK—Executive Edition, Edited by Ross McKeever. 476 pages. Urban Land Institute, 1200 18th St., Washington 6, D. C. $15.

The 1960 edition of this manual on community planning is a thorough revision of this excellent reference work, which first appeared in 1947. The "Executive Edition" has the same basic structure as previous editions, but details and applications have been updated and new trends and developments have been added.

New features include a completely revised section on shopping centers to emphasize leasing and management and an expanded section on residential building, to incorporate a discussion of buildings near airports.

The book presents the views and practices of the Community Builder's Council of the Urban Land Institute. All are authorities on land planning and community development.

The book is divided into two sections—residential communities and shopping centers. Each covers market analysis, site evaluation and layout of buildings and streets.

Just Published

WATERWAYS OF THE UNITED STATES—edited by Harry O. Locher. 132 pages. National Association of River and Harbor Contractors, 15 Park Row, New York 38, N. Y. $10.00

STATICALLY INDETERMINATE STRUCTURAL ANALYSIS—by R. L. Sanks. 602 pages. Ronald Press Co., 15 E. 26th Street, New York 10, N. Y. $10.00

MODERN COMPUTING METHODS—second edition, edited by E. T. Goodwin. 170 pages. Philosophical Library, 15 E. 40th Street, New York 16, N. Y. $6.00

(*Books continued p. 202*)

Whatever you do...

drill... blast... dig... break... tamp... pump...

USE LE ROI AIR EQUIPMENT!

Whether you dig ditches, construct turnpikes, or carve tunnels through solid rock, remember this about Le Roi air equipment: You *never* have to take the *next best* in size or quality for *your* job!

Take **air compressors.** Nobody else offers a wider choice. Le Roi sizes range from 75 to 1200 cfm — tops in the field. Rugged Le Roi rotaries, for example, deliver rated capacity effortlessly for as long as you need it. Their light, balanced design eases on-site positioning and assures full power for greater man-tool output.

Some things you can get *only* from Le Roi . . . like the **Le Roi 1200 rotary,** the world's largest. Its twin engine and 600-cfm compressor units can be used separately — or as one unit to supply 1200-cfm air for the big jobs. The **Le Roi Tractair**® is a self-propelled air source (42-hp tractor — 125-cfm compressor) that goes anywhere under its own power, with provisions for a dozen useful attachments.

Le Roi shock-absorbing breakers and sinkers boost operator comfort and output with 55% less kick at the handle, but with full 100% bite at the bit.

You have a wide choice of breakers, sinkers, drills, spades, tampers, drivers and other **Newmatic® hand-held air tools** for light, medium, or heavy duty. For big jobs, there's a broad selection of portable tools and self-propelled **percussive and rotary rigs** designed for easy operation.

Whatever you do, standardize on Le Roi air equipment. For more information, contact your Le Roi Distributor, or write direct.

75 ROTARY COMPRESSOR (75 CFM)

85 PISTON-TYPE COMPRESSOR (85 CFM)

125 ROTARY COMPRESSOR (125 CFM)

125 PISTON-TYPE COMPRESSOR (125 CFM)

TRACTAIR® (125-CFM COMPRESSOR—42-HP TRACTOR)

AIR TOOLS

365 ROTARY COMPRESSOR (365 CFM)

600 ROTARY COMPRESSOR (600 CFM)

1200 ROTARY COMPRESSOR (1200 CFM)

ROTARY DRILLING RIGS

TRAC-NEWMATIC

LE ROI

Division of Westinghouse Air Brake Co.
Sidney, Ohio

"High capacity...
low maintenance...

BRUISING STRENGTH!"

That's how B. L. Anderson sums up the dependable performance of his 5 Link-Belt Speeder rock shovels

Not too long ago we looked in on one of the midwest's most progressive quarry operators. Purpose of the visit? Ask B. L. Anderson how his year-old Link-Belt Speeder LS-98 one-yard rock shovels are doing in his multiple quarry operation in Iowa.

WHAT ABOUT CAPACITY?

"We're getting more than we expected. We're surprised at their high capacity. We lean strong to a two-shovel operation — one on each side of the crusher. We're now feeding about 300 tons an hour with the Link-Belts . . . could load up to 4,000 tons a day.

"Those Speed-o-Matic power-hydraulic controls give our production a shot in the arm. They're a lot easier to handle . . . they keep our operators fresh. I don't know how other companies can go on making the old type."

WHAT ABOUT MAINTENANCE?

"We're happy with the low maintenance. The heavy dust doesn't bother the clutches. Our operators spend very little time adjusting the clutches.

"These rigs are built to take a pounding. Before we got our Link-Belts we used to come in for repairs at the end of the year. We won't be coming in this year!"

WHAT ABOUT POWER?

"Plenty of that! Our engines are equipped with hydraulic couplings for better shock absorption. Even with the heaviest loads we don't stand the rigs on end."

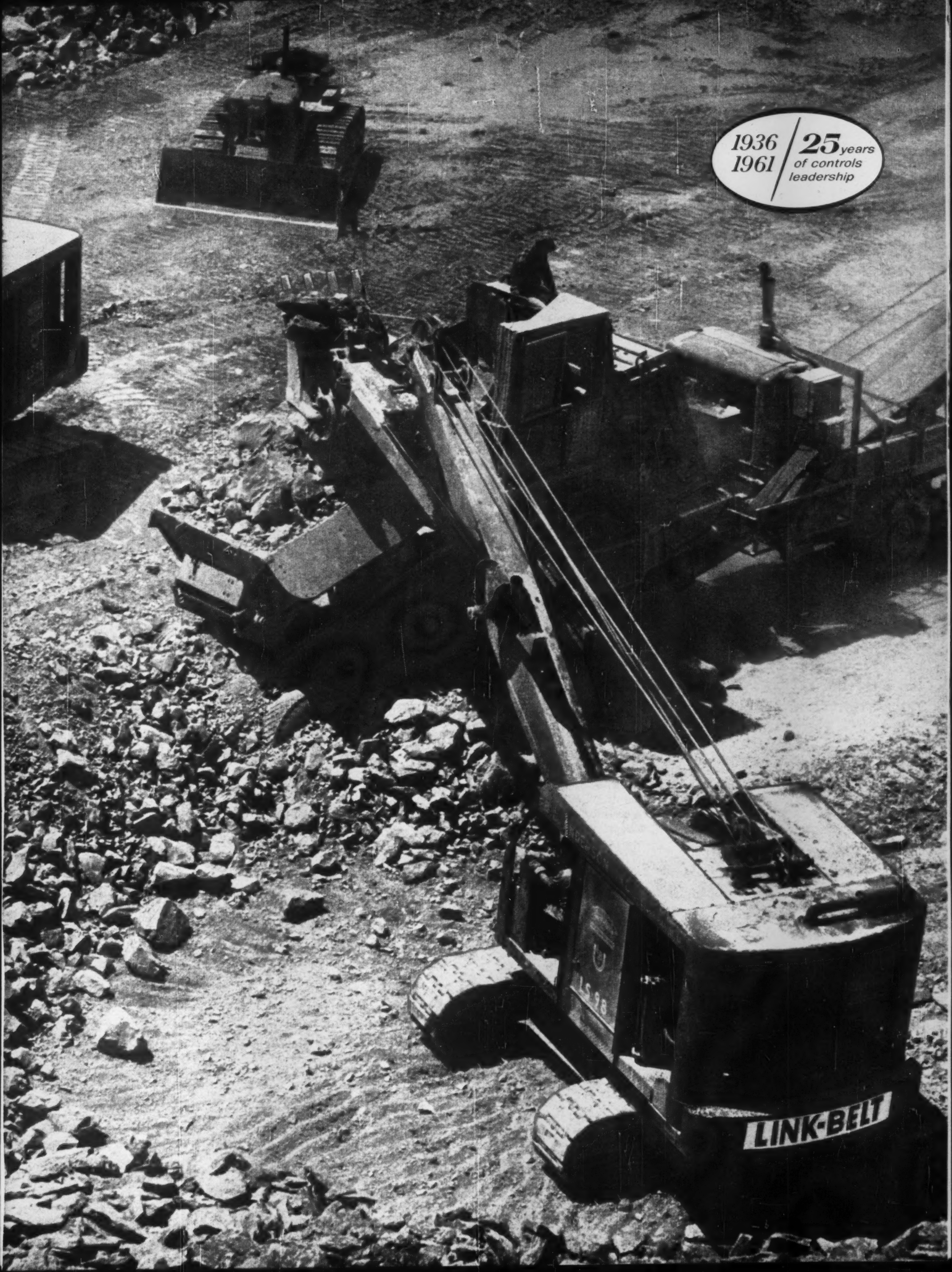
No matter where we go, who we ask, the answer is the same: "Link-Belt Speeder rock shovels give you peak capacity and profits, less trouble." See your Link-Belt Speeder distributor for full details. Or write Link-Belt Speeder Corporation, Cedar Rapids, Iowa. 105-61N

LINK-BELT SPEEDER

21 crawlers
7 truck-cranes
3 self-propelled

It's time to compare . . . with Link-Belt Speeder

CIRCLE 200 ON READER SERVICE CARD

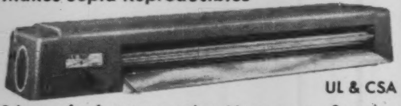

1936
1961
25 years
of controls
leadership
LS 98
LINK-BELT

NEW BLU-RAY Whiteprinter offers 50% MORE SPEED!

MAKES CLEAR DIAZO PRINTS IN SECONDS FOR PENNIES!

Copies anything printed, typed, drawn or written on any translucent material. Just slide Tracing and Diazo Paper thru BLU-RAY. Get FAST, EXACT EXPOSURE.

Makes Sepia Reproducibles



From $197.50 All Prices Eastern List

UL & CSA Approved

3 Lamps for faster operation. No warm-up. Speed control for exact exposure. 3 Models: 14", 27", 42" print width capacities: any length. Portable.

Thousands of Guaranteed BLU-RAYS in use not because they're the cheapest, but because they're the best, most reliable dollar value. Get a demonstration and see for yourself.

AVAILABLE ON LOW COST MONTHLY LEASE PLAN

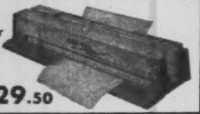
NOW BLU-RAY OFFERS 2 DIAZO DEVELOPERS

1. NEW FLUTED SEE-THRU AMMONIA DEVELOPER TUBE.

FROM $11.55

2. NEW CONTINUOUS ROTARY DRY DEVELOPER FOR FASTER DEVELOPING.

For use with BLU-RAY and other Rotary Diazo Whiteprinters.



3 Models from $129.50

SEND FOR LITERATURE OR DEMONSTRATION IN YOUR OFFICE

BLU-RAY by R.E.C. Reproduction Engineering Corporation 10 Westbrook Road, Essex, Connecticut

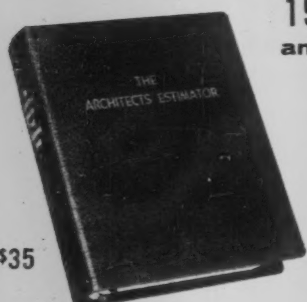
CIRCLE 19 ON READER SERVICE CARD

What will it cost?

CHECK YOUR BUILDING PROJECT with reliable JOB COSTING figures

1961 ARCHITECTS ESTIMATOR and COST REFERENCE GUIDE

Supplies accurate preliminary unit building costs in convenient form. Here are all the important facts and figures on current unit costs for every construction job large or small from excavation to final sub-contractor. All costs in this invaluable book include mark-up, overhead and profit. Regarded by architects, engineers, contractors and subs in the building industry as the most comprehensive guide to normal profitable operation. Valued highly by industry and government in planning construction projects. Special section devoted to foreign building costs. Revised yearly, new edition just published.



$35

The most complete construction cost Reference Guide ever compiled.

SAVE 10%—order both books for $45.00

ORDER TODAY BY MAIL

RESEARCH PUBLISHING CO., Dept. EN
P.O. Box 42004, Los Angeles 42, Calif.

Send _____ copies of ARCHITECTS ESTIMATOR @ $35.00 each; _____ copies of PROFESSIONAL CONSTRUCTION ESTIMATOR @ $15.00 each. (In Calif. add 4% Sales Tax)

Enclosed is ☐ Check ☐ Money Order

NAME __________

ADDRESS __________

CITY __________ ZONE ____ STATE __________

PROFESSIONAL CONSTRUCTION ESTIMATOR

A Labor & Material Calculator

the Professional
CONSTRUCTION ESTIMATOR

$15

Gives the time it takes labor to complete each unit of work on any construction project. An essential aid to your operation. A companion book to the "ARCHITECTS ESTIMATOR".

Both compiled by the foremost professional estimator, Jacques Ing Cramer Priest

. . . Books

A HOLE IN THE BOTTOM OF THE SEA—by Willard Bascom. 352 pages. Doubleday and Co., 575 Madison Ave., New York 22, N. Y. $4.95

PROFESSIONAL MANPOWER AND EDUCATION IN COMMUNIST CHINA—by Leo A. Orleans. 260 pages. National Science Foundation. Superintendent of Documents, Government Printing Office, Washington 25, D. C. $2.00

BLUEPRINT READING: AN INTERPRETATION OF ARCHITECTURAL WORKING DRAWINGS—by William J. Hornung. 129 pages. Prentice Hall Inc., Englewood Cliffs, N. J. $6.65

STANDARD SPECIFICATIONS FOR CONSTRUCTION OF ROADS AND BRIDGES ON FEDERAL HIGHWAY PROJECTS, JANUARY 1961.—Bureau of Public Roads. 383 pages. Superintendent of Documents, Government Printing Office, Washington 25, D. C. $2.25

MINE VENTILATION AND AIR CONDITIONING—by Howard L. Hartman. 398 pages. Ronald Press Co., 15 E. 26th Street, New York 10, N. Y. $12.00

STRENGTH OF THICK-WALLED CYLINDRICAL VESSELS UNDER INTERNAL PRESSURE FOR THREE STEELS—by Joseph Marin and Tu-Lung Weng. 13 pages. Welding Research Council, 29 W. 39th Street, New York 18, N. Y. $1.00

THE BEHAVIOUR OF HIGHWAY BRIDGE FLOORS WHEN STATICALLY TESTED TO FAILURE—by S. D. Lash and B. B. Hope. 69 pages. Report No. 13. Queens University, Kingston, Ontario, Canada. March 1961.

FLEXIBLE PAVEMENT DESIGN STUDIES 1960.—Highway Research Board Bulletin 269. 74 pages. National Academy of Sciences, 2101 Constitution Ave., Washington 25, D.C. $1.60

ASPHALT CHARACTERISTICS AND ASPHALTIC CONCRETE CONSTRUCTION.—Highway Research Board Bulletin 270. 60 pages. National Academy of Sciences, 2101 Constitution Ave., Washington 25, D. C. $1.40

INVESTIGATIONS OF NONMETALLIC WATERSTOPS, EVALUATION OF THE EFFECT OF ALKALIES AND ACCELERATED EXTRACTION TESTS.—U. S. Army Engineer Waterways Experiment Station, Corps of Engineers, Vicksburg, Miss. 50¢.

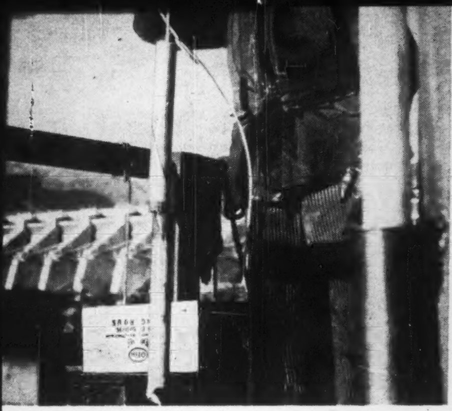
DEVELOPMENT OF METHOD OF TEST FOR CONCRETE MIXER PERFORMANCE.—U. S. Army Engineer Waterways Experiment Station, Vicksburg, Miss. 50¢.

AIR CONDITIONING SYSTEM FOR OTHER THAN RESIDENCES—by National Fire Protection Association, No. 90A, 30 pages, 50 cents.

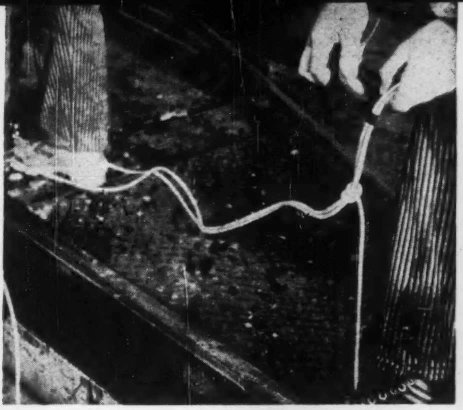
WARM AIR HEATING AND AIR CONDITIONING SYSTEMS FOR RESIDENCES—National Fire Protection Association, No. 90B, 28 pages, 50 cents.

PALISADES DAM AND POWERPLANT, Technical Record of Design and Construction. 535 pages. Office of Chief Engineer, Code 841, Bureau of Reclamation, Building 53, Federal Center, Denver 25, Colorado. $10.00

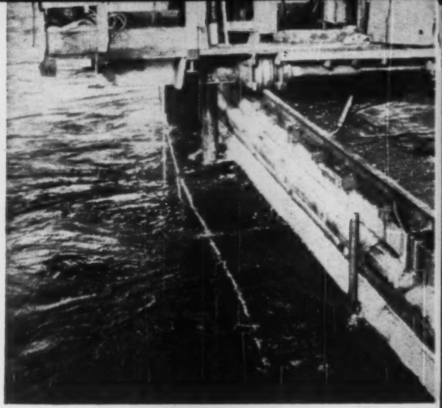
(*Books continued p. 204*)



Primacord was threaded through two 2" x 16" powder sticks. Charge was lowered through white aluminum tube shown protruding from iron pipe and then tamped into place. Plastic reinforced Primacord proved ideal for use as the downlines because of its ruggedness and water-resistant characteristics.



Working on the barge, a double line of Reinforced Primacord was laid out for the trunklines. Picture shows how tightly the single Plastic Reinforced Primacord downline was knotted. In spite of near-freezing weather, Primacord was readily pliable, and knots were easily tied. For extra security, the trunkline was taped.



After the downlines were tied in position, the Primacord trunkline was well weighted with rock at each end and lowered to the river bottom. Drilling, loading and stemming were done through a sand pot. Holes were 4'-4½" and were at 5' to 8' centers, depending on the estimated rock conditions and depth.

PRIMACORD®

helps solve underwater blasting problem and stray electric currents danger for Merritt, Chapman & Scott

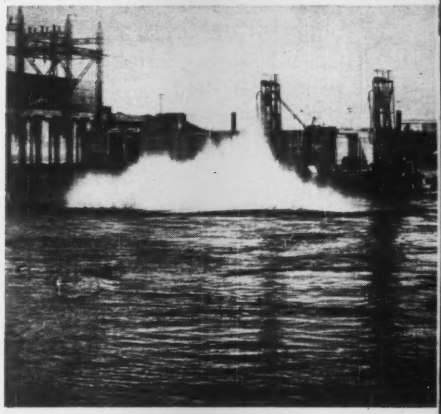
The Priest Rapids dam is located on the Columbia River in the Ellensburg-Ephrata area of Washington State, about 200 miles downstream from the famous Grand Coulee. Excavation of the power plant discharge channel could not be completed while the area was dry. Consequently, the rock breaking and excavation had to be done underwater, working from barges.

To add to the problem, the river current averaged approximately 5 miles per hour. The bottom was uneven, ranging from five to thirteen feet. The power plant was immediately adjacent and limited the size of the individual shots. And the danger of premature explosion caused by stray electric currents was increased by the needed electrical equipment on the barges.

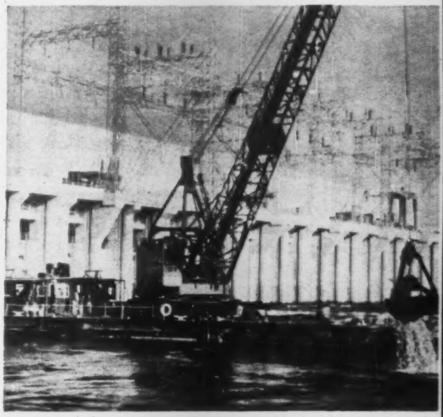
The problem was solved by using a double line of Reinforced Primacord Detonating Fuse for the trunklines and Plastic Reinforced Primacord for the downlines.

Primacord is so often the answer to difficult situations because of its many unique qualities. Primacord cannot be set off by stray electric currents—or by normal vibration, friction or shock. It is less sensitive than the explosive itself . . . detonates at a speed of almost four miles a second along its entire length . . . has a minimum initiating strength of a blasting cap at all points. It is simple, easy and *economical* to use.

These advantages make Primacord ideal for a wide range of underground as well as underwater blasting. And for primary and secondary pit blasting, too. Primacord is available in a number of standard and special types developed to meet varying needs. For further information, consult your explosives supplier or write



Effect of a light nine-hole blast. Drill barge has moved back. Nearness of dam and high-tension electric lines is clearly shown. The shot was fired using two electric blasting caps which were attached at the **downstream** end of the trunkline to prevent any possibility of cutoffs.



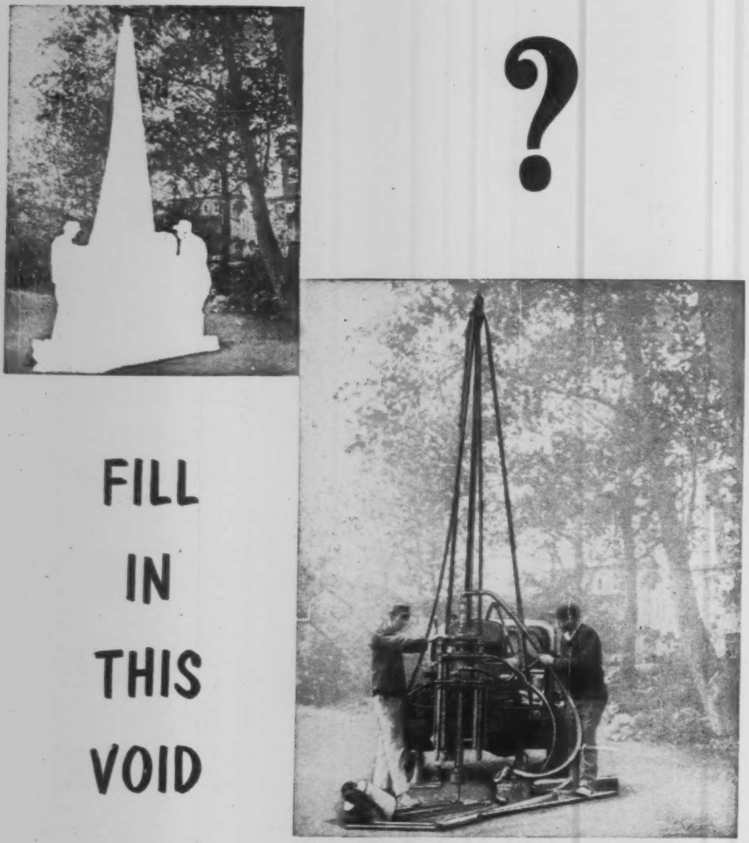
Dredge barge moved in following blast. Clamshell conveyed the blasted rock to dragline from which the material was loaded directly into trucks. In this manner, the entire discharge channel was dredged out to the required depth.

THE ENSIGN-BICKFORD COMPANY EB
Simsbury, Connecticut • Since 1836

THERE IS A TYPE OF PRIMACORD® FOR EVERY TYPE OF BLASTING

IS THERE A VOID IN YOUR DRILLING PROGRAM

?



FILL
IN
THIS
VOID

WITH STURDY . . . DEPENDABLE . . .
SPRAGUE & HENWOOD EQUIPMENT

Many progressive and successful firms throughout the United States and in foreign countries want and use no other core drilling equipment except Sprague & Henwood's. They have found it to be rugged . . . easy to use . . . versatile. Are you having trouble? You might just have the wrong equipment. Why not write to Sprague & Henwood today and describe your present drilling conditions, or the drilling conditions you expect to encounter. Sprague & Henwood will supply you with equipment and complete drilling information, enabling you to go far toward filling the void in your drilling program.

Look for our emblem... It's your Seal of Quality

SPRAGUE & HENWOOD, Inc. S&H
SCRANTON 2, PA.
MEMBER OF: DIAMOND CORE DRILL MANUFACTURERS ASSOC.

New York • Philadelphia • Nashville • Pittsburgh • Grand Junction, Colo. • Tucson • Buchans, Nfld.
Export Division: Sprague & Henwood International Corporation, 11 W. 42nd St., New York, N. Y.

Design of Underground Openings in Competent Rock—Bulletin 587. Superintendent of Documents, Government Printing Office, Washington 25, D.C. 30¢.

Traffic Origin-and-Destination Studies—Bulletin 253. Highway Research Board, 2101 Constitution Ave., Washington 25, D.C. $3.80.

Glued Laminated Timber for Bridge Beams—by K. O Tamberg and M. W. Huggins. Report No. 11. University of Toronto, Toronto, Ont., Canada.

Reflection Cracks in Bituminous Resurfacing—by M. M. Davis. Report No. 12. University of Toronto, Toronto, Ont., Canada.

Cold Weather Ready Mixed Concrete—Publication No. 34. National Ready Mixed Concrete Assoc., 1411 K St., N.W., Washington 5, D.C.

Effects of Aggregate Size on Properties of Concrete—Publication No. 8. National Ready Mixed Concrete Assoc., 1411 K St., N.W., Washington 5, D.C.

Coal Resources of Ohio—Bulletin 58. Ohio Division of Geological Survey, Orton Hall, 155 South Oval Drive, Columbus, Ohio. $2.00 (plus 2¢ tax in Ohio).

Coal Resources of the Upper Part of the Monongahela Formation and the Dunkard Group in Ohio—Report of Investigations No. 38. Ohio Division of Geological Survey, Orton Hall, 155 South Oval Drive, Columbus 10, Ohio. 50¢ (plus 2¢ tax in Ohio).

Proceedings of the 14th Purdue Industrial Waste Conference—Dean G. A. Hawkins, Engineering Administration Building, Purdue University, Lafayette, Ind. $3.50.

Economic Analysis in Highway Programming, Location and Design—Special Report 56. Highway Research Board, 2101 Constitution Ave., Washington 25, D.C. $4.00.

Manual of Consulting Engineering Practice—New York State Association of Consulting Engineers, Inc. Members C.E.C. contact State Association Secretaries for copies ($1.25); nonmembers, copies obtained from Donald E. Brill, 5368 Main St., Williamsville 21, N.Y. ($2.25).

Summary of Marine Waste Disposal Research Program in California—State Printing Division, Documents Section, Sacramento 14, Calif. $1.00 (plus 4¢ tax for California).

Residential Building Sewers—Publication 787. Building Research Advisory Board, 2101 Constitution Ave., Washington 25, D.C. $2.00.

Small-Size Pipe for Sanitary Lateral Sewers—Publication 507. Building Research Advisory Board, 2101 Constitution Ave., Washington 25, D.C. $1.50.

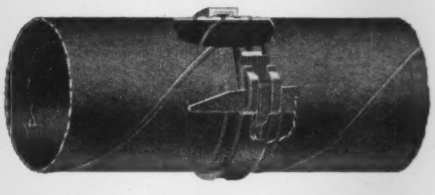
Helena Valley Pumping Plant and Tunnel, Technical Record of Design and Construction. 163 pages. Office of Chief Engineer, Code 841, Bureau of Reclamation, Building 53, Federal Center, Denver 25, Colorado. $3.10

It's NAYLOR........The Pipe and Coupling Combination for Savings

Contractors looking for ways to save time, work and money will like the way NAYLOR Spiralweld pipe and Wedgelock couplings team up to simplify and speed the job.

Light weight makes this pipe easy to handle, easier to install. The lock-seamed-spiralwelded structure adds the strength and safety you'd expect from heavy-wall pipe. The NAYLOR Wedgelock coupling saves time in installation because reliable connections can be made with only one side of the pipe in the open.

To simplify and speed your next job requiring air, water or ventilating lines, look into this pipe and coupling combination. Just ask for Bulletin No. 59.



NAYLOR Wedgelock couplings make a positive connection securely anchored in standard weight grooved ends. A hammer is the only tool required to connect or disconnect the coupling.

NAYLOR PIPE *Company*

1248 East 92nd Street, Chicago 19, Illinois
Eastern U. S. and Foreign Sales Office: 60 East 42nd Street, New York 17, N. Y.

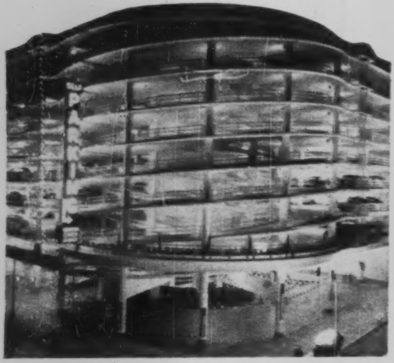
CIRCLE 205 ON READER SERVICE CARD

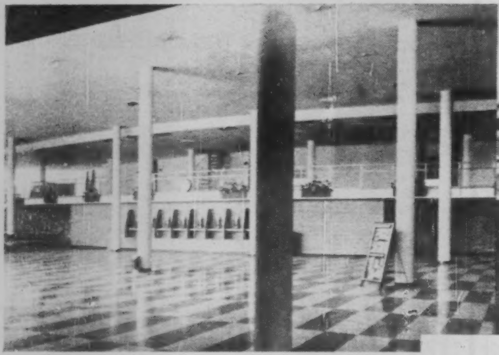
SONOCO
Sonotube®
FIBRE FORMS

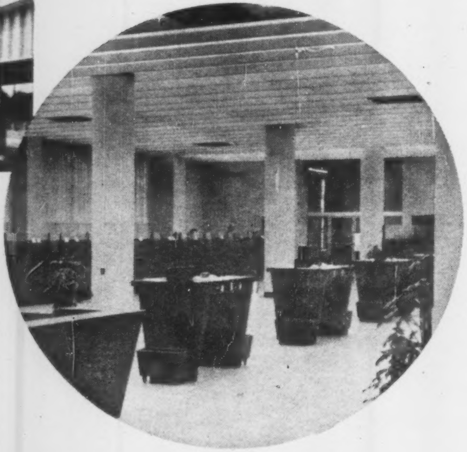
save money on round concrete columns

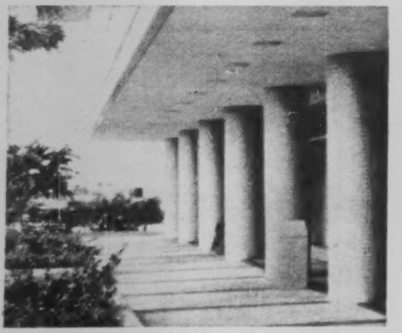
- **Low in cost, lightweight, easy to handle.**
- **Place, brace, pour and strip quickly.**
- **Versatile—form any type round column in any type structure.**
- **Easier to tie in with other forms, other members.**
- **One-piece, one-time-use forms; no assembly, no dismantling, no delays, no inventory required.**

SONOTUBE Fibre Forms are the fastest, most economical method of forming round concrete columns. There's a type for any job . . . in sizes 6" to 48" I.D., standard 18' lengths or specified lengths.









5714

See our catalog in Sweet's

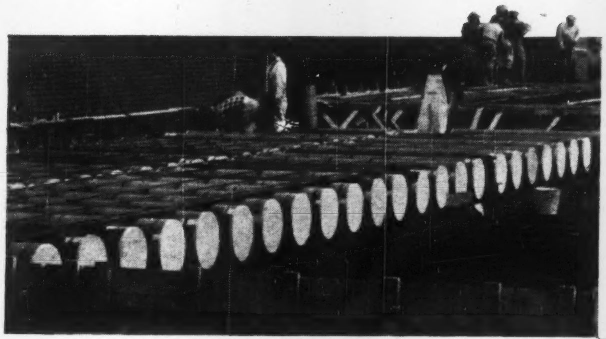
For complete information and prices, write

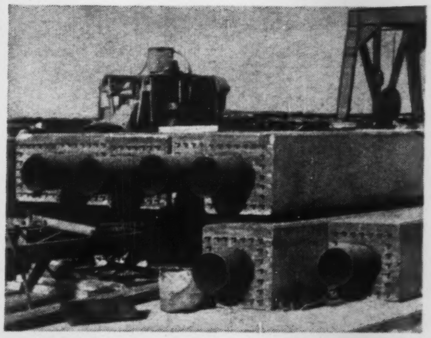
SONOCO

Construction Products

SONOCO PRODUCTS COMPANY, HARTSVILLE, S. C. • La Puente, Calif.
Fremont, Calif. • Montclair, N. J. • Akron, Indiana • Longview, Texas • Atlanta,
Ga. • Ravenna, Ohio • **MEXICO:** Mexico City • **CANADA:** Brantford, Ont.

CIRCLE 206 ON READER SERVICE CARD





SONOCO

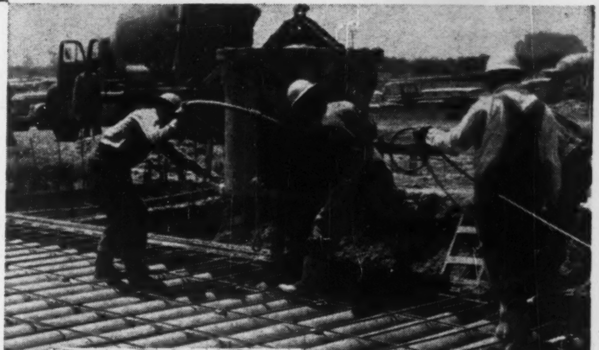
SONOVOID

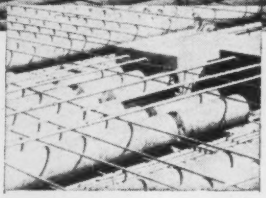
FIBRE TUBES

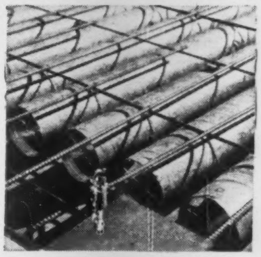
form weight-reducing, cost-saving VOIDS in concrete construction

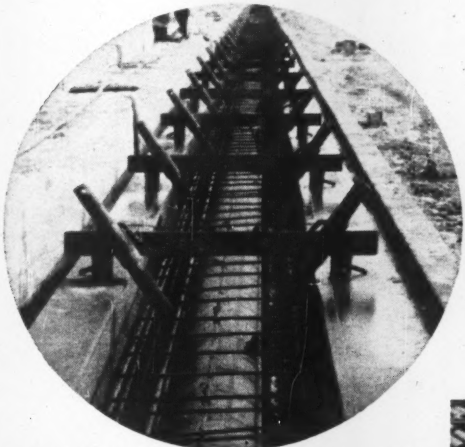
- **Voids reduce weight without impairing structural strength.**
- **Voids save concrete and reinforcing steel.**
- **Voids permit longer span slabs, greater flexibility of design.**
- **Lightweight voided members save on foundations, supports, and many other aspects of construction.**

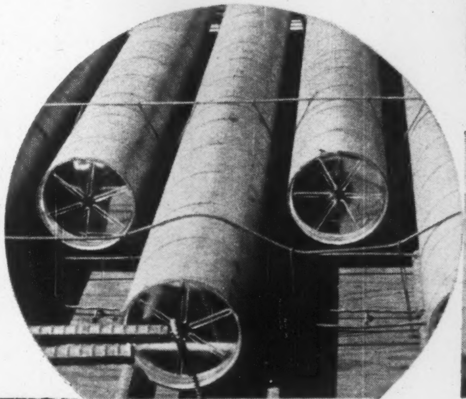
SONOVOID Fibre Tubes are specifically designed to form cost-saving voids in cast-in-place or precast concrete members. They are lightweight, low in cost, easy to handle and place. Available 2.25" to 36.9" O.D., with or without end closures. Can be sawed.

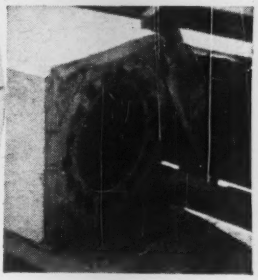












See our catalog in Sweet's

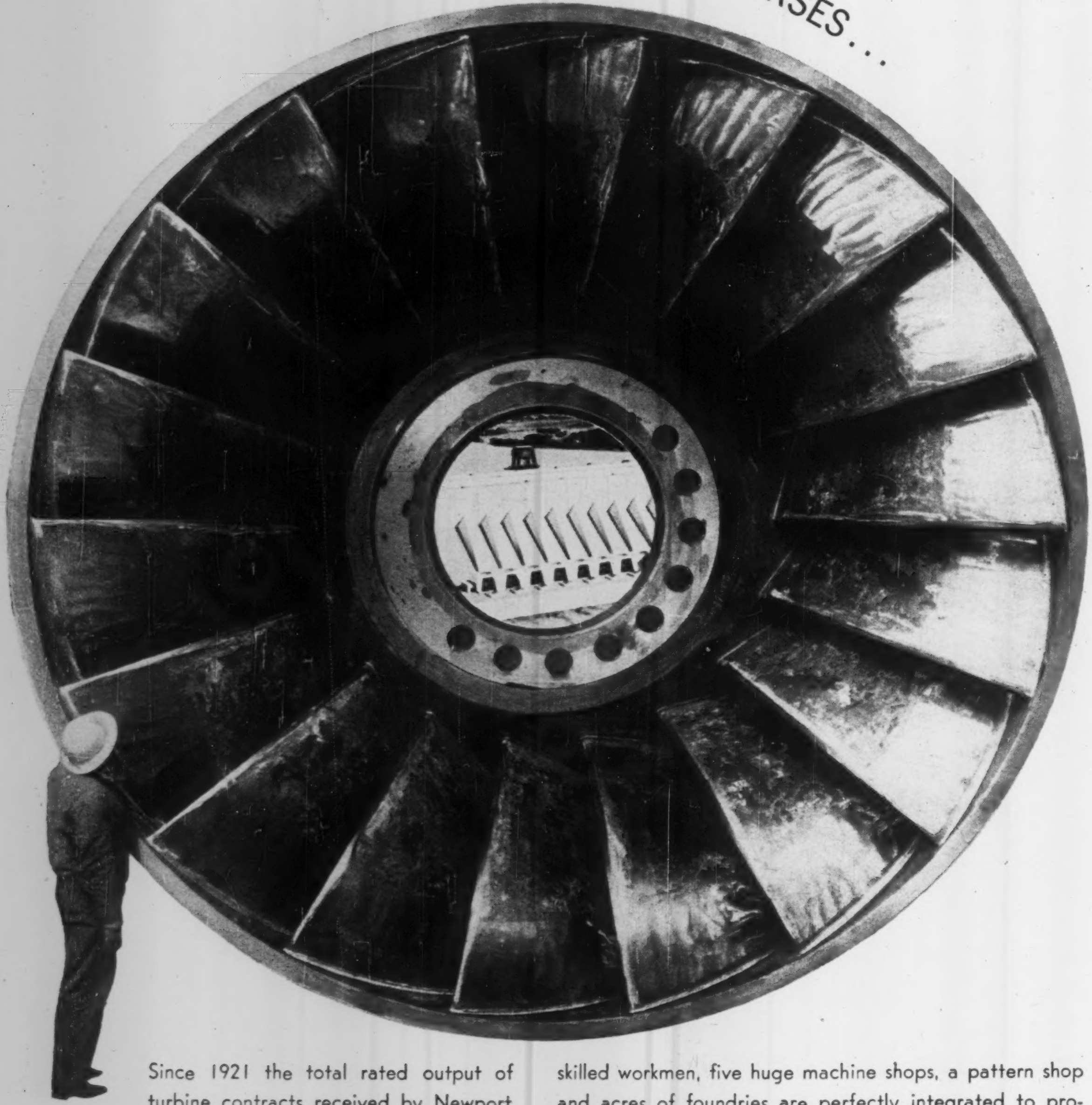
For complete information and prices, write

SONOCO

Construction Products

SONOCO PRODUCTS COMPANY, HARTSVILLE, S. C. • La Puente, Calif.
Fremont, Calif. • Montclair, N. J. • Akron, Indiana • Longview, Texas • Atlanta,
Ga. • Ravenna, Ohio • **MEXICO:** Mexico City • **CANADA:** Brantford, Ont.

NEWPORT NEWS HARNESSES 12,000,000 HORSES...



Since 1921 the total rated output of turbine contracts received by Newport News exceeds 12,000,000 horsepower. The Niagara Project, Grand Coulee, Hoover and Chief Joseph are but a few of the installations for which Newport News has designed and built such equipment as hydraulic turbines, valves, gates and penstocks.

Newport News has the men . . . the methods . . . and the machines to take gigantic jobs like these in stride. Large engineering and design staffs, hundreds of highly skilled workmen, five huge machine shops, a pattern shop and acres of foundries are perfectly integrated to produce large units in the shortest possible time . . . from water power equipment to wind tunnels, from cracking towers to paper dryer rolls.

Look to Newport News with its seventy-five years of metal fabricating experience. Your inquiries are invited.

Newport News
SHIPBUILDING AND DRY DOCK CO.
NEWPORT NEWS, VIRGINIA

Legal

Verbal Contracts

Performance made an oral agreement a binding one

An oral agreement, when executed by one of the parties, constitutes a binding contract.

The enforcement of a verbal contract after part performance has occurred is illustrated by a New York case that arose under the following circumstances:

The Peckham Road Corporation had a contract with the State of New York to rebuild part of a highway. The contract provided: "All areas outside the highway right-of-way which are found necessary for the disposal of materials removed under this item shall be acquired by the contractor at his own expense."

The owner of property along the highway that was being rebuilt agreed with the contractor to allow dirt fill to be dumped on the property and to be leveled with contour of the land. Thereafter, the contractor not only deposited dirt on the land but also large slabs of concrete which had been removed from the existing highway. As a result of this condition, an additional conversation took place between the landowner and the contractor whereby the contractor agreed to dig a trench and bury the concrete so as not to interfere with cultivating the ground or any other use thereof. This procedure did not alleviate the condition and the contractor agreed to bring in a shovel and cover the area and leave the property in proper repair. The contractor failed to live up to this promise, whereupon the landowner brought an action against the contractor for the damage sustained.

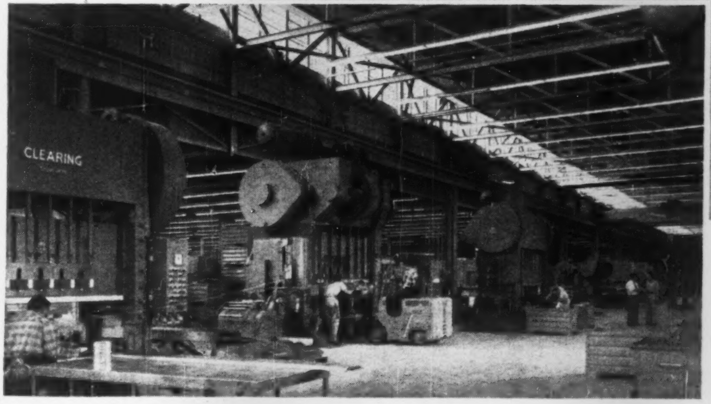
The contractor contended that the alleged oral conversations were not sufficient to constitute a contract. The case was tried by a jury which brought in a verdict for the landowner in the sum of $3,000, which judgment was affirmed on appeal.

(*Please turn the page*)

These summaries of court decisions are prepared by I. Vernon Werbin, Esq., New York attorney and licensed professional engineer, who is author of the following books published by McGraw-Hill Book Company, Inc.: *Legal Phases of Construction Contracts; Legal Guide for Contractors, Architects and Engineers;* and *Legal Cases for Contractors, Architects and Engineers.*

13,500 sq. ft. of ⅛" Luxlite Coolite Heat Absorbing Glass, Glare Reduced one side, has been installed in plant of Cutler Hammer, Inc., Lincoln, Ill., pioneer electrical manufacturer. Design and construction by The Austin Company.

MISSISSIPPI GLASS
tailors light
TO SUIT YOUR NEEDS



The property of light diffusion in translucent glass by Mississippi is one of the most useful tools available to engineers and architects. Rooms can be adequately daylighted far from windows; small skylights can cover large expanses of floor space with shadowless daylight; privacy can be secured . . . light controlled. Working hand-in-glove with modern daylighting practice, Mississippi glass reduces contrast that results in costly visual errors . . . keeps interiors more comfortable.

MISSISSIPPI GLASS

Write today for new catalog. Address Dept. 20.

With Coolite, Heat Absorbing glass, occupants see better . . . feel better . . . work better. Coolite and a wide variety of other patterns, wired and unwired, are available at your quality glass distributor. See him today.

KEEP
AMERICAN WORKERS BUSY
BUY...
UNITED STATES GOODS

MISSISSIPPI GLASS COMPANY
88 Angelica St. • St. Louis 7, Missouri
NEW YORK • CHICAGO • FULLERTON, CALIFORNIA

WORLD'S LARGEST MANUFACTURER OF ROLLED, FIGURED AND WIRED GLASS

1 of many jobs you can do with amazingly versatile

WELD-CRETE®

Example: Weld-Crete at work

Here you see a badly spalled and worn concrete railing on highway bridge. How can it be repaired?

Weld-Crete was used to permanently bond new concrete to the old concrete surface.
Result? The railing looks like new!

Today, for as little as 4c per square foot, you can permanently bond new concrete directly to old concrete . . . or to any sound surface . . . no matter how smooth. The answer is Weld-Crete . . . the patented, free flowing liquid bonding agent used by leading contractors and builders the world over . . . on thousands of new construction, remodeling and repair jobs . . . large and small.

With Weld-Crete you can bond cement toppings to old floors, patches to walks and drives, new concrete to concrete block, concrete slab, bond skim coat of parging, mud coat for tile to any surface, stucco to any surface . . . even machine mounts and pads as thin as ½".

You can use Weld-Crete with complete confidence. Job-proven for 10 years. Tested by Froehling & Robertson, Pittsburgh Testing Laboratory etc. Used by U.S. Army Corps of Engineers, U.S. Navy, G.S.A. Approved for use in New York City by New York City Board of Standards & Appeals, and in the city of Los Angeles by the Board of Building & Safety Commissioners.

Ask your building supply dealer about Weld-Crete or write us direct for fact-packed literature. Address Box 5938-I, Larsen Products Corporation, Bethesda 14, Md.

LP LARSEN PRODUCTS CORPORATION

First with the finest in bonding agents

The appellate court[1] stated: "While these conversations in themselves might not be sufficient to support an executory contract, the performance by plaintiff (landowner) in allowing the defendant (contractor) to proceed as outlined constituted a contract, the performance of which by the plaintiff was binding upon the defendant. It is apparent from the record that the plaintiff was seeking dirt fill for use on her property but it does not imply defendant was given permission to dump all kinds of material removed from the road on the property. At least it was a factual question settled by the jury who not only heard the testimony of the respective witnesses but inspected the premises."

(1) Zach v. Peckham Road Corporation, 200 N.Y.S. 2d 703, N.Y. Supreme Court, Appellate Division, May 16, 1960.

Liability for Injuries May Depend on the Facts

Is the general contractor or the sub liable when one of the sub's employees is injured on a job? The general contractor may have an obligation to provide a reasonably safe place in which to work and be liable for a breach of that obligation.

The question was recently raised in Ohio. The facts were these:

An employee of a subcontractor was killed on a job. He was helping a crane operator. The crane came in contact with a high-tension wire.

The general contractor was sued for damages for the wrongful death of the worker.

The U. S. District Court for the Southern District of Ohio entered a judgment in favor of the general contractor. But the Court of Appeals[1] reversed the decision and ordered a new trial.

The evidence showed that the general contractor had a safety man overseeing the entire operation. This was sufficient, the court said, to present questions of negligence to the jury. The questions, the court explained, were whether the contractor failed to provide a safe place in which to work and whether the contractor should have realized the hazard of the wires and, in the exercise of ordinary care, have eliminated the hazard.

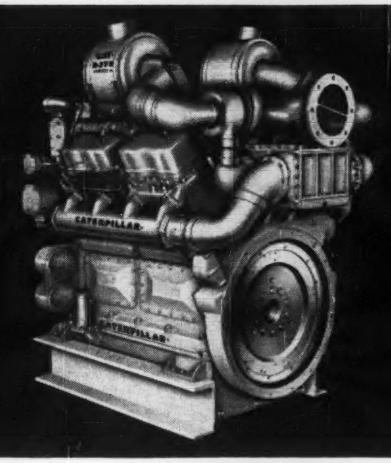
A further question for the jury, the court said was whether the employee who was killed was contributorily negligent.

(1) Parsons v. Blount Brothers Construction Company, 281 F. 2d 414.

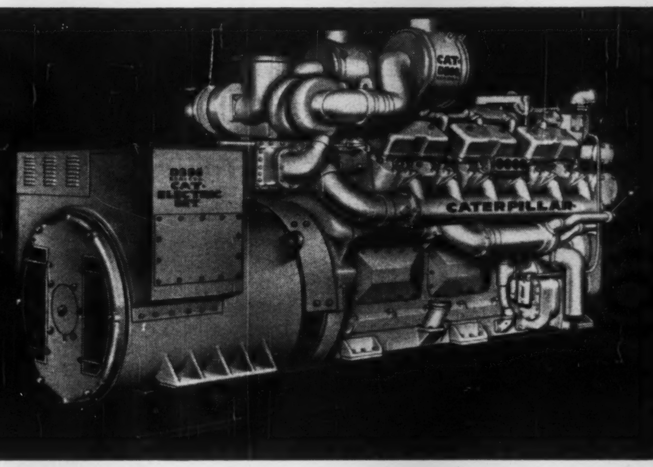
(*Legal continues p. 212*)

engine power
BY CATERPILLAR

new Cat D398–D379



Cat D379 Industrial Engine. The 6.25″ bore, 8.00″ stroke D379 and D398 both offer the latest in attachments including marine gears and generators. The D379 Electric Set develops up to 350 KW continuous, 400 KW standby.



Cat D398 Electric Set. The D398 Electric Set shown here with Static-Regulated, Static-Excited Generator features a new generator with built-in static excitation system with no exciter generator or vibrating parts. Develops 500 KW continuous, 600 KW standby.

Give more horsepower per pound, per dollar than any other industrial engine in their class

The V12 D398 and the V8 D379 are rated at 950 and 630 maximum HP, respectively. Electric set versions reach to 600 and 400 KW. Marine ratings exceed 1000 HP. These engines are now available at prices that are less than crankshaft replacement prices of some competitive engines in their class.

Published list prices show the D398 to be thousands of dollars less than the next lowest priced industrial engine that will develop comparable horsepower. Other advantages are quality aluminum alloy bearings, aluminum pistons with cast-iron ring band for top two compression rings, drop forged-dynamically balanced crankshaft and high strength rigid block. These engines save in space and weight, too . . . with at least 35-40% less size and 4800 pounds less weight than other makes with comparable horsepower.

Here are more reasons why Cat D398 and D379 Diesels and Electric Sets give you extra value

NEW PERFORMANCE STANDARDS

- Turbocharged-Aftercooled design
- Static-Regulated, Static-Excited Cat Generators
- High flow lube and water systems
- Ability to burn wide range of fuels

NEW ENGINE FLEXIBILITY

- 100% HP from either end of engines
- Six available accessory drives – up to 50 HP each
- Controls available for either side
- Standard (counterclockwise) rotation or opposite rotation

NEW SERVICE EASE

- Fuel or lube filters serviced from either side
- Remove heads without disturbing manifolding
- Easily inspect or remove pistons, rods and bearings through large side ports
- Externally mounted oil pumps for easy inspection and maintenance

For complete specifications on the D398 and D379 Diesel Engines or Electric Sets, contact your Caterpillar Dealer or Caterpillar Engine Division, Peoria, Illinois.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

Caterpillar Tractor Co., Engine Division, Peoria, Illinois, U. S. A.

Contract Rescission

Use of materials did not waive right to rescind

The general rule is that the right to rescind a contract may be lost where the purchaser accepts and uses the materials and fails to exercise the right to rescind within a reasonable time. But under Nebraska law, a buyer of materials may rescind his contract after the materials are used if they do not comply with contract requirements.

That is the conclusion of a federal court in a case that arose at Lincoln Air Force Base in Nebraska.

Bradley-Dodson, the defendant, was the successful bidder for construction of an electrical distribution system. Ascher Corporation sold the defendant the primary cable needed for the work. The cable was installed but was later rejected by the Army Engineers, and was removed and replaced. Ascher sued the defendant and its surety, under the Miller Act, to recover the unpaid portion of the purchase price of the cable. The defendant claimed that the cable failed to meet government specifications that it be shielded. It counterclaimed for the additional cost it incurred for the replacement of the cable and for the amounts it had already paid Ascher.

At the trial, the parties stipulated that the cable that had been furnished by Ascher was not shielded and thus did not conform with the government specifications.

The case was tried by a court without a jury and judgment was rendered for the defendant on both the main claim and the counterclaim which judgment was affirmed on appeal.[1]

Ascher contended that in view of the fact that the defendant accepted and used the cable, it was in no position to rescind the contract.

The appellate court held that the furnishing of supplies not in conformity with specifications does not, in and of itself as a matter of law, defeat the obligation of the prime government contractor to pay for those supplies or render the Miller Act unavailable to the supplier. Miller Act benefits may be available even though materials supplied are not directly or ultimately incorporated into the project, the court said.

The court held, however, that the contractor had effectively rescinded the contract and was entitled to the extra costs incurred for replacement of the cable.

(Continued on p. 214)

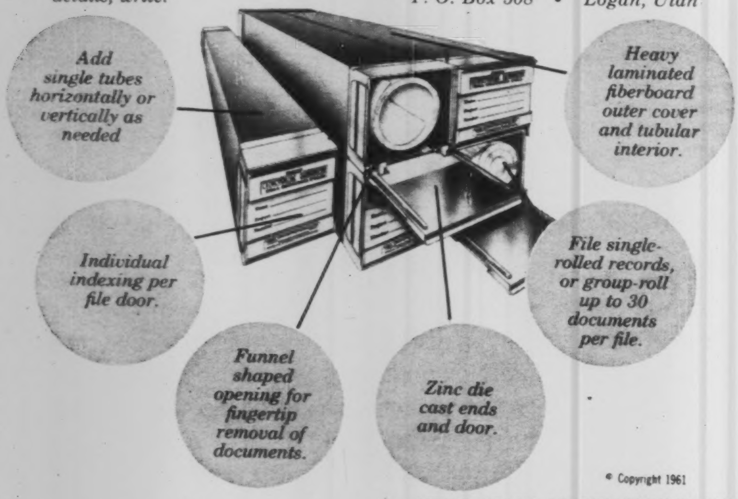
DO YOU HAVE THIS FILING PROBLEM ?

Odd-sized drawers, cabinets and pigeon holes robbing you of space!

Bulky filing units waste up to fifty percent of a room's filing space.

Com-PACK-t INTERLOCK FILES can be assembled in any width . . . any height. Fit in and around conventional type files, pillars, walls and heating and air conditioning units. *For additional details, write:*

P A C K®
INTERLOCK FILING SYSTEM
Pack Manufacturing Co.
P. O. Box 508 • Logan, Utah


Add single tubes horizontally or vertically as needed
Heavy laminated fiberboard outer cover and tubular interior.
Individual indexing per file door.
File single-rolled records, or group-roll up to 30 documents per file.
Funnel shaped opening for fingertip removal of documents.
Zinc die cast ends and door.

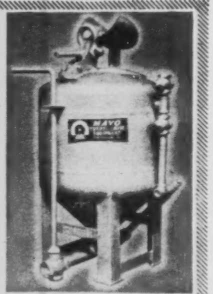
© Copyright 1961

CIRCLE 27 ON READER SERVICE CARD

DUDGEON HYDRAULIC JACKS
SALES RENTALS
CAPACITY TO 600 TONS
FOR:
PILE TESTING
UNDER-PINNING
BRIDGES
PIPE PUSHING
SOIL TESTING
Write to Dept. R
RICHARD DUDGEON INC.
789 BERGEN ST. • ST 9-4040 • BROOKLYN, N. Y.

PNEUMATIC GROUTER and "Pea Shooter"

Efficient and easy to operate. Places low pressure grout . . . also injects sodium silicate emulsions to stabilize ground. Readily converts to Pea Shooter. See Catalog No. 13.



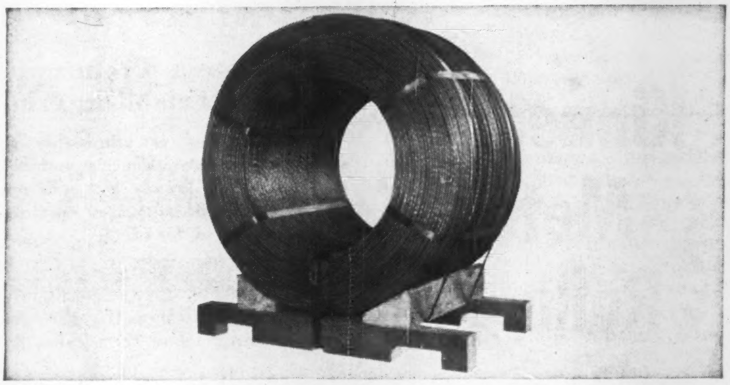
MAYO
TUNNEL AND MINE EQUIPMENT
Lancaster, Penna.

CIRCLE 31 ON READER SERVICE CARD

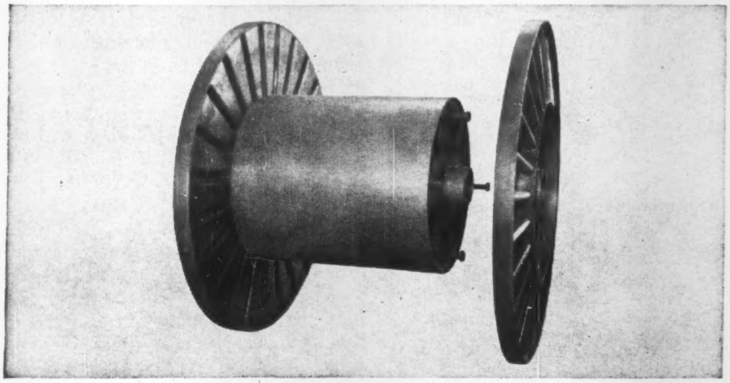
Here it is...

ROEBLING'S NEW REEL-LESS PAK

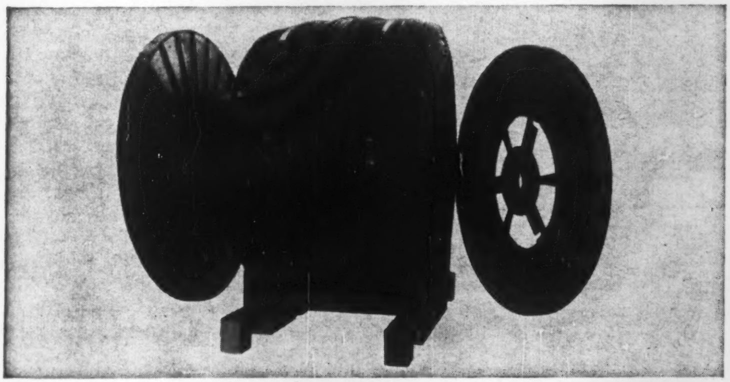
for Prestressed Concrete Strand saves you time, money, labor



The Roebling "Reel-Less Pak" is received at your yard as shown here, securely strapped to a wooden pallet for convenient handling by fork lift trucks.



This steel pay-off reel, in two sections, is designed for quick assembly. It has the same outside dimensions as standard wood reels . . . fits all existing racks.



The drum is easily inserted through the center of the package and the end flange mounted. The reel is now ready for placement in the pay-off stand.

IT'S SURPRISINGLY SIMPLE—Roebling 7-Wire Uncoated Stress-relieved Prestressed Concrete Strand is shipped to you in a package of approximately 6,000 lbs. The package is quickly and easily mounted on a take-apart, steel pay-off reel at your plant and handled in the same way as a wood reel.

IT'S SURPRISINGLY ECONOMICAL—Substantial savings over the cost of wood reels are passed on to you . . . a reduction in your net cost of strand. Standard lengths per package are increased to 12,000 feet for $^1/_2$ inch, 16,000 feet for $^7/_{16}$ inch, 22,000 feet for $^3/_8$ inch strand. This means you replace reels in the racks 30% fewer times.

IT'S THE NEWEST of many Roebling contributions to better, faster and more efficient prestressed concrete fabrication. Roebling has played a major role in development of prestressing techniques . . . and is the manufacturer of the finest wire and strand available. For complete details on this new development—and for data on other phases of prestressed concrete—call or write Roebling's Construction Materials Division, Trenton 2, New Jersey.

ROEBLING CF&I

Branch Offices in Principal Cities
John A. Roebling's Sons Division
The Colorado Fuel and Iron Corporation

CIRCLE 213 ON READER SERVICE CARD

For Better Doors,
EVERYTHING POINTS
To Kinnear . . .

For the extra advantages of coiling, interlocking-steel-slat action **(originated by Kinnear)** —and . . .

. . . for doors that open **completely** out of the way . . .

. . . for efficient doors that offer even greater convenience when **power-operated** . . .

. . . for all-metal protection against wind, weather, intrusion and vandalism . . .

. . . for doors that permit full use of surrounding **floor, wall, and ceiling** space at all times . . .

. . . for doors that often deliver 30, 40 — **even 50 or more** years of low-cost service . . .

. . . for heavily galvanized doors that give many **extra** years of corrosion-free service . . .

—and for exclusive REGISTERED doors for which all parts are always replaceable from master details kept in fireproof vaults, insist on —

Kinnear
Metal
Rolling
Doors

The KINNEAR Mfg. Co.
FACTORIES:
1820-40 Fields Ave., Columbus 16, Ohio
1742 Yosemite Ave., San Francisco 24, Calif.
Offices and Agents in All Principal Cities

KINNEAR®
ROLLING DOORS
Saving Ways in Doorways

It noted that the nonconformity of the cable was questioned from the outset and that the period between delivery and formal rejection was utilized in trying to get a waiver from the government engineers. The supplier was aware of the defects and of the reasons for the delay in rejection.

(1) United States v. Bradley-Dodson Co., 281 F. 2d 676, U. S. Court of Appeals, Eighth Circuit, August 16, 1960.

Default on a Promise Does Not Establish Fraud

Oral evidence is admissible to show that the execution of a contract was induced by fraud. But it is not admissible if the action complained of falls short of fraud.

In a recent New Jersey case,[1] one of the issues involved was the admissibility of parol evidence to show that the execution of a contract had been induced by fraud.

As to this phase of the litigation, the court stated: "There can be no question that parol evidence is admissible to establish that the execution of a contract was procured by fraud, notwithstanding a provision that no representations had been made except those set forth in the agreement Guilder v. Boonton-Pine Brook-N. Y. Bus Co., 110 N.J.L. 103, 105-106, 164 A. 2d 316 (E. & A. 1932); Tams v. Abrams, 120 N. J. Eq. 253, 258-259, 185 A. 521 (E & A. 1936); 32 C.J.S., Evidence, Section 979 (a), page 942 et seq. (1942)

"Fraud may always be shown by parol evidence, since no attempt is being made to alter, vary or contradict the integrated instrument, but only to show that it is not an unimpeachable document, i.e., that it is void or voidable. Harker v. McKissock, 12 N. J. 310, 323, 96 A. 2d 660 (1953)."

The court further stated: "Legal fraud consists of a material misrepresentation of a presently existing or past fact, made with knowledge of its falsity, with the intention that the other party rely on it, and he does so rely to his damage. In equitable fraud the second element (knowledge) is not necessary, but the other four are essential. A mere promise to do something in the future, subsequently unfulfilled, does not constitute actionable fraud. Anderson v. Modica, 4 N. J. 383, 391, 73 A. 2d 49 (1950). It is a mere breach of contract for which an action for money damages will lie.

"A promise to do something in the future, which the promisor never intended to keep when he made the promise, may satisfy the first element of

(*Continued on p. 216*)

"UNIT offers a buyer the *most* for his money"

H. E. STRUTHERS
ST. PETERSBURG, FLORIDA

This veteran excavating contractor speaks from profitable experience—he has owned five UNIT machines, and is currently running two ¾-yd. draglines. "I've been a consistent purchaser of UNIT machines," Mr. Struthers says, "because they offer a buyer the *most for his money* in regards to work capability, low cost of operation, and the great ease with which the machines can be lubricated and repaired."

There are many good reasons why a UNIT gives you more for your money. *Direct-in-line drive* from engine to main machinery is one. This simple, highly efficient power transmission system contributes substantially to a UNIT'S on-the-job performance by delivering power directly to the point of action with low friction loss.

UNIT'S *exclusive one-piece main machinery gear case* is another reason. All gears, shafts and bearings are sealed in this housing . . . operate continuously in oil . . . are positively protected against dirt and abrasives. Routine lubrication is easily handled with conveniently grouped fittings provided for all parts requiring greasing.

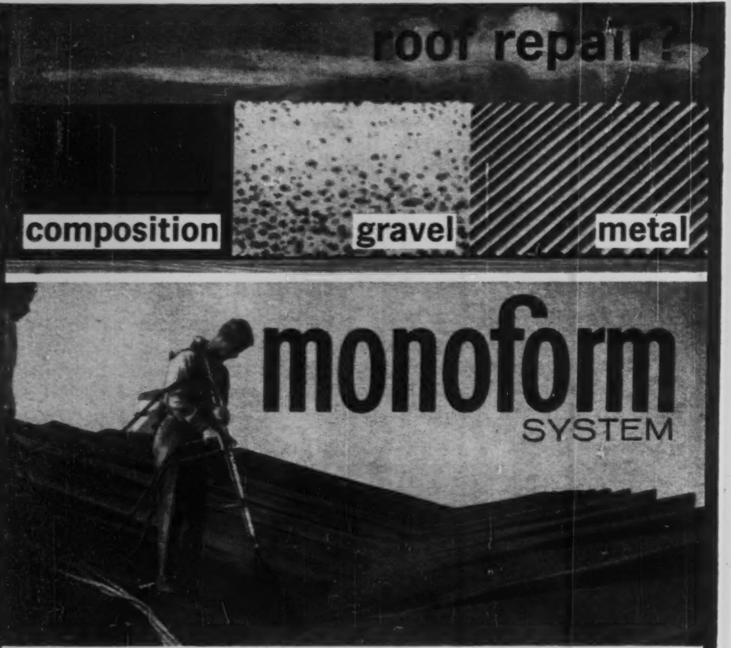
And, ready accessibility to main machinery makes your operator or mechanic more maintenance-minded . . . eases servicing. Convenient sliding side panels and easily lifted hood covers make it easy to get at various machinery parts. Broad platform walkways on both sides make it especially easy to service the machine.

For a full rundown on UNIT features, contact your nearby dealer now. He handles UNIT excavators in sizes from ½- to 1-yd., crawler cranes from 6- to 22-ton capacity, and 10- to 40-ton truck cranes.

UNIT

UNIT CRANE & SHOVEL CORP.
6315 W. Burnham Street
Milwaukee 19, Wisconsin

3U61



monolithic application

fast-effective-proven

Modern roof maintenance—as well as new roof application and below grade membranes—now calls for the Flintkote Monoform system. Using the Sealzit gun, special Monoform compounds are applied simultaneously with chopped reinforcing glass fibres over prepared composition, gravel or metal roof surfaces—creating a monolithic membrane that is tough, resilient, weather resistant.

® THE SEALZIT GUN IS MANUFACTURED UNDER THE FOLLOWING U.S. PATENTS: 2,787,314; 2,933,125, AND 2,813,751. OTHER U.S. PATENTS PENDING. PATENTED IN CANADA. WORLD-WIDE PATENTS PENDING.

FLINTKOTE monoform*
SYSTEM†

*A TRADE MARK OF THE FLINTKOTE COMPANY †U.S. PATENT APPLIED FOR

THE FLINTKOTE COMPANY
30 Rockefeller Plaza, New York 20, N.Y. or
Box 2218 Terminal Annex, Los Angeles 54, Cal.

Please send bulletin MS-11

NAME________
FIRM________
ADDRESS________
CITY________ ZONE____ STATE____
E-6-22

fraud as a material misrepresentation of the promisor's state of mind at the time of the promise. Piechowski v. Matarese, 54 N. J. Super. 333, 345, 148 A. 2d 972 (App. Div. 1959).

"The trial court gave defense counsel adequate opportunity to state fully his proffer of proof before rejecting it as violative of the parol evidence rule. Neither the proof proffered, nor indeed the pleadings give any indication that there was a fraudulent misrepresentation of the promisor's state of mind at the time the representations were allegedly made.

"The proffer reveals nothing more than representations on plaintiff's part to do certain things in the future. Failure to keep such promises, even if made, would not, without more, constitute fraud. Accordingly, the parol evidence was properly excluded."

(1) Dover Shopping Center, Inc. v. Cushman's Sons, Inc., 164 A. 2d 785, Supreme Court of New Jersey, Appellate Division, October 17, 1960.

New York Court Approves Lien of a Subcontractor

A subcontractor who is trying to get paid for the work he has done may be able to establish and enforce a lien even though he has no right of action against the owner.

This procedure was used in a New York case in the following situation:

Gentile's, Inc. was a subcontractor on a homebuilding job. The value of the work he performed for the general contractor was $1,519.63.

The general contractor refused to pay Gentile's and the latter sued the owner. The case was dismissed and the dismissal was affirmed on appeal. Gentile's, Inc. v. Teresi, 199 N.Y.S. 2d 450.

Gentile's then brought an action to foreclose a mechanic's lien.

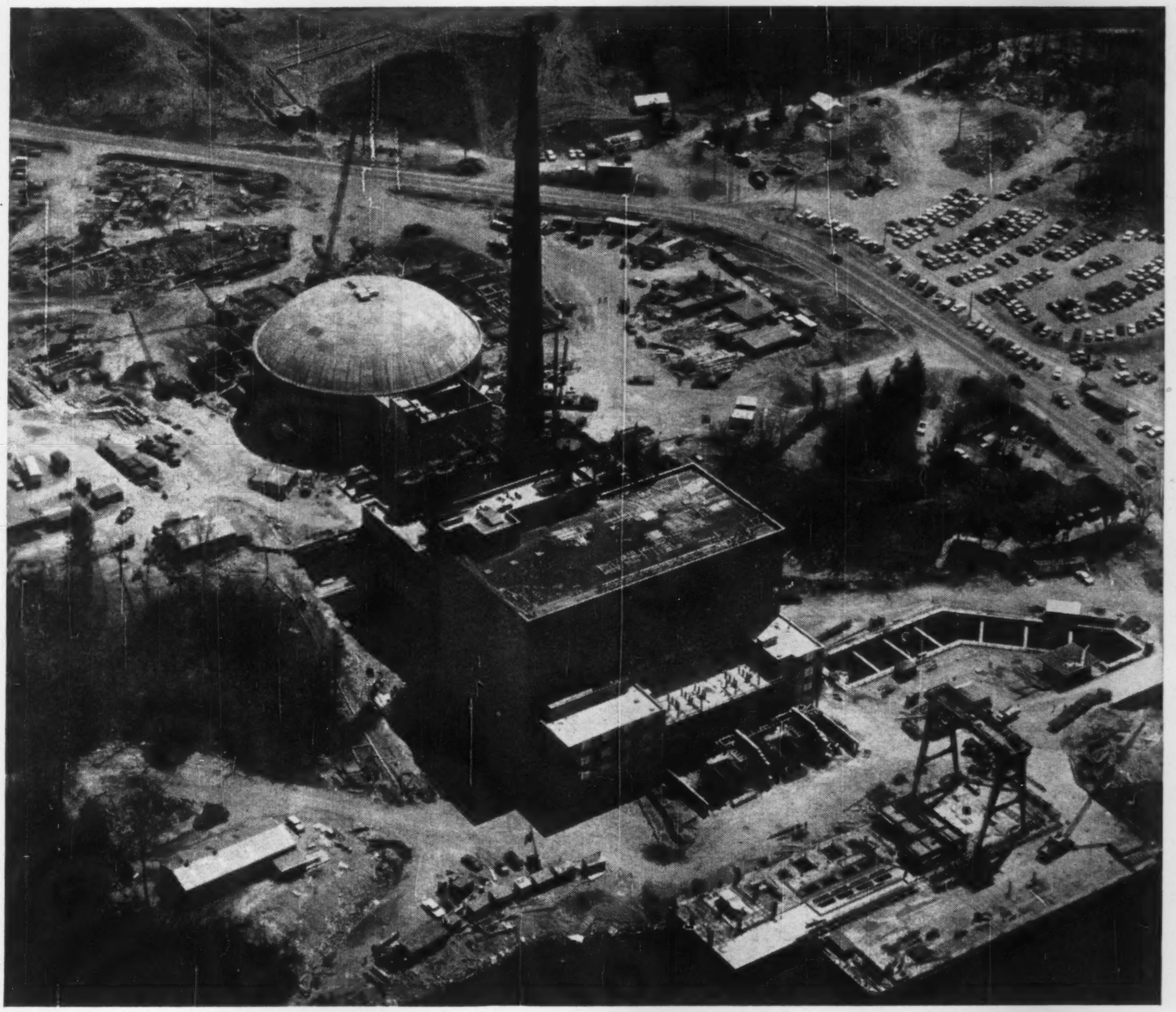
The trial court dismissed the action. It said the contract price had been reduced from $72,000 to $45,000 and there was nothing due the general contractor to which a lien could attach.

The decision was appealed and reversed, and a new trial was ordered.

The appellate court said the reduction in contract price occurred after Gentile's had performed its part of the work. The change was made too late, it held, to defeat the lien. Under the circumstances, it said, the subcontractor was entitled to a lien to the extent that the value of the work done by the general contractor exceeded the amount paid to him.

The contract price was disregarded

(*Continued on p. 218*)



Lead provides critical radiation shielding at Indian Point

At Con Edison's $100-million nuclear power station, lead is specified for attenuation of gamma-radiation intensities in two areas where space and weight considerations are of prime importance.

Lead shot fills 22 feet of the annulus between the outer steel pipe and inner transfer tube which carries highly radioactive spent fuel elements from reactor to storage for cooling. The 92 tons of lead shot were simply poured in, obviating the need for specially fabricated shield components.

Lead brick, with lead shot filling the interstices, lines the door, set in a lead-filled steel frame, between fuel-handling building and reactor compartment. Only twelve inches thick, the door provides gamma-ray shielding equivalent to 5½ feet of concrete.

Brick and shot are just two of many forms in which lead is available to save space, weight, and construction costs while providing what the AEC has called "the best practical gamma shielding" for most applications. Other forms of lead, like sheet, extrusions, wool, castings and impregnated plastics, are convenient and effective for shielding applications.

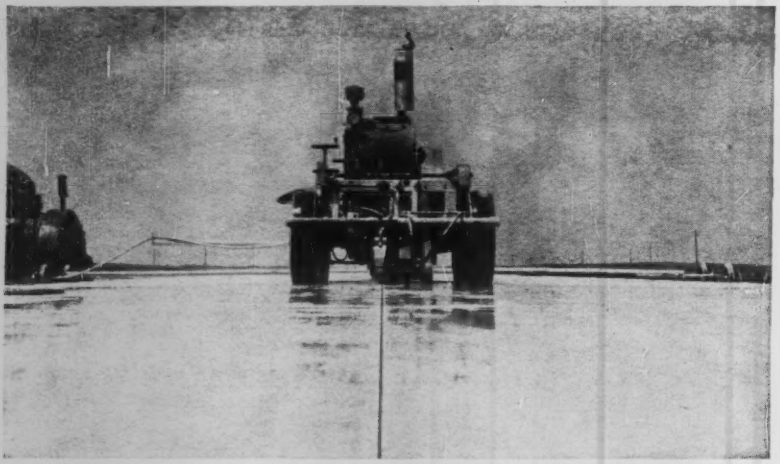
If you have a radiation shielding problem, you can get solid help in solving it with lead by contacting Lead Industries Association, 292 Madison Ave., New York 17, New York.

4072

LOOK AHEAD WITH LEAD

DIAMOND BLADE SAWING OF CONCRETE
Case Report: CORONA, CALIFORNIA
COST-$.09 per linear foot

TYPE OF WORK—Concrete Highway
AGGREGATE—Gravel
SAWING OPERATION—Diamond blades for all sawing
TYPE OF DIAMOND—Engelhard Hanovia SND-MB diamond abrasive.
DIMENSIONS—Longitudinal and transverse 2" x 1/8". Transverse joints sawed at 4° angles—on 15 ft. centers.
PRODUCTION—Longitudinal joints up to 4500 l/f per day.



The savings made possible by modern diamond blade sawing in initial highway construction are significant—but not nearly so important as its effect on maintenance. Diamond blade sawing produces the *only* joint that has proved reduction in maintenance costs—by as much as 50%! In California for example, where sawed joints are specified for all new highway construction, there is an 80-20 ratio between new construction and maintenance expenditures.

Diamond blade sawing maintains maximum concrete strength and homogeneity in the joint areas because *material is removed,* not displaced, eliminating the basic cause of spalling, cracking and chipping. Cuts are precise, with uniform highway and runway joints provided by high-speed, semi-automatic procedures that neither interfere with nor delay the actual paving operation, saving time and labor costs.

* * * *

For detailed information and field-use reports from state highway officials and contractors, write to Engelhard Hanovia, Inc., for Report #101.

Engelhard Hanovia, Inc. is the leading supplier of SND-MB diamond abrasive, a result of research that has greatly increased diamond cutting efficiency, to diamond blade manufacturers

★ENGELHARD HANOVIA, INC.★
INDUSTRIAL DIAMOND DIVISION
113 ASTOR STREET · NEWARK 2, NEW JERSEY

in measuring the amount of the lien. The owners claimed that at the time the subcontractor performed its part of the work no written contract existed between the contractor and the owner. Under such circumstances, it said, the value of the work done should be considered rather than the contract price.

(1) Gentile's Inc. v. Teresi, 199 N.Y.S. 2d 287, Appellate Division of N. Y. Supreme Court, March 18, 1960.

Sub Must Look to General For Pay—Not to Owner

As a general rule, a subcontractor has no right of action against the owner for any amounts due him from the prime contractor.

The point was raised in a New York case which developed under the following circumstances:

Pellegrino Oil Heat and Appliance Company furnished labor and materials for the plumbing and heating systems for a new house.

The general contract for the construction of the house was let to John Vereb. That contract provided that Pellegrino was to receive the subcontract for the installation of the plumbing and heating system for which he was to be paid $3,774.25.

Pellegrino brought an action against the owners to recover a balance he said was due on the subcontract. The owners interposed the defense that plaintiff was a subcontractor and must collect the unpaid balance from the general contractor.

The court submitted the case to the jury to determine whether there was any express or implied contract between the subcontractor and the owners for the work involved.

This was done because Pellegrino testified that there was an oral agreement. He said he agreed to perform the work for the owners if they agreed to pay him and that he would not perform the work for the general contractor. The owners and the general contractor denied that there was any such agreement and put the subcontract in evidence to show the entire transaction between the parties. The general contractor testified that the subcontractor read the contract before he executed it.

The jury brought in a verdict in favor of the owners and the judgment was affirmed on appeal.[1]

The court said that the jury was justified in finding that the services were rendered under a contract with Vereb, the general contractor.

(1) Pellegrino v. Almasian, 201 N.Y.S. 2d 275, N.Y. Supreme Court, Appellate Division, May 26, 1960.

Central Pennsylvania Quarry, Stripping and Construction Company is using Joy 450-DR Drill, RP-600 Compressor teams to blast an estimated 1¾ million cubic yards of rock on a 6½ mile stretch of Interstate 40 near Nashville, Tennessee.

Joy Drill-Compressor Teams "go anywhere—drill anything" on Central Penn's Interstate 40 rock job

Central Penn operators like the way the Joy TDM Carrier with 450-DR Drill will "go anywhere—drill anything." The TDM's scramble over extremely rough terrain and steep grades while pulling the 600 cfm Joy compressors. The rugged U-Bar TDM's provide drilling stability under all conditions up to 45° slopes. Drilling in broken rock, the 450-DR's have averaged 320 feet of 3½" hole per shift for a year—including all moving and set up time.

Joy's 450-DR Drills have proved their ability to outdrill anything in all types of rock. The unique rotation assist on the 450-DR provides the extra boost to keep going under any conditions. An independent air motor powers the rotation assist and also provides reverse rotation for hammer-free steel changes. For complete information on how the Joy TDM Mounted 450-DR Drill and RP-600 Compressor team can cut your drilling costs, write for Bulletin 3183-24.

JOY CONSTRUCTION EQUIPMENT IS SOLD AND SERVICED BY THE JOY DISTRIBUTOR IN YOUR AREA

Portable Compressors	Trac Drills	Tungsten Carbide Rock Bits	Hand-Held Rock Drills

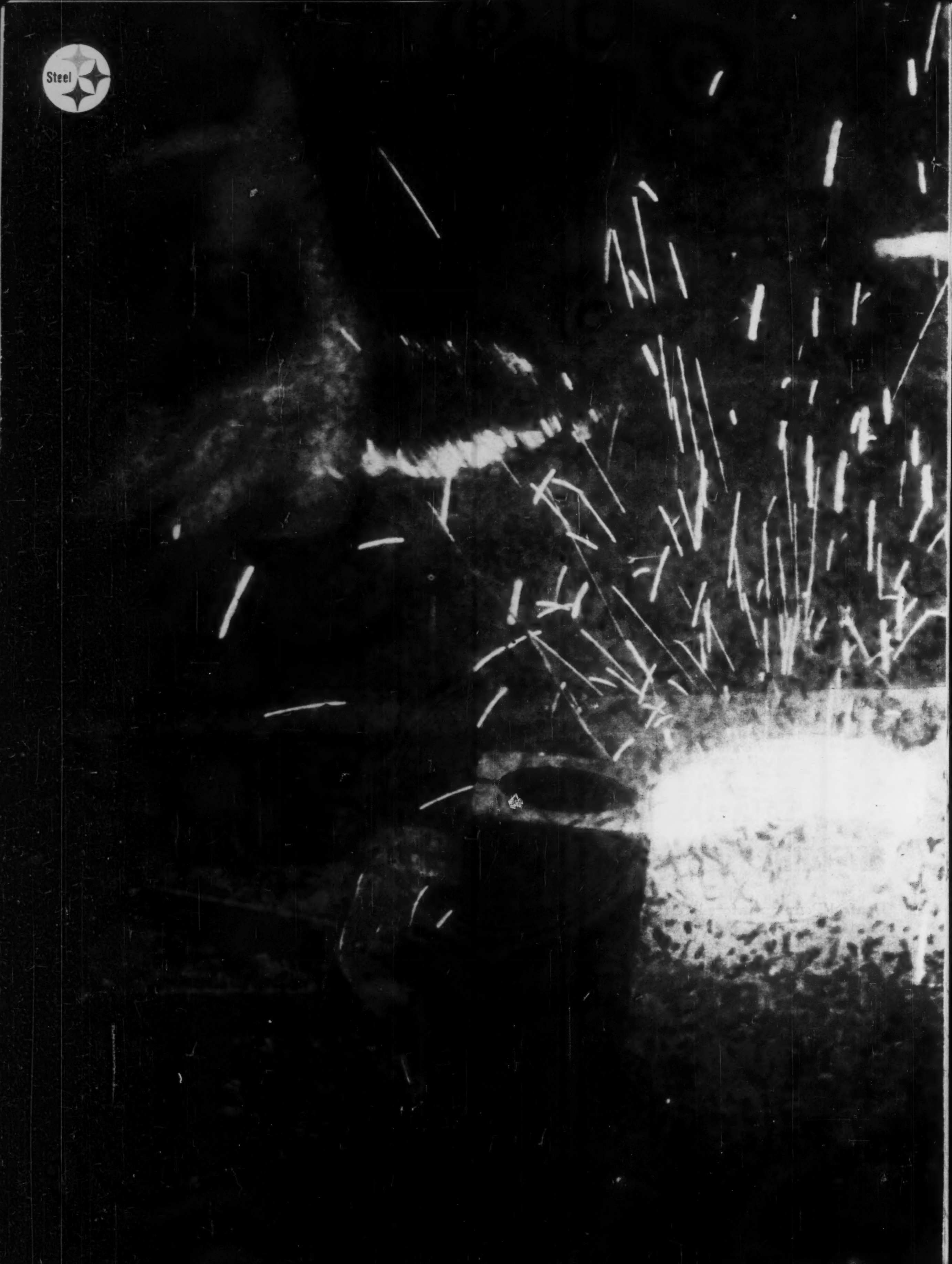
JOY

Joy Manufacturing Company
Oliver Building, Pittsburgh 22, Pa.

In Canada: Joy Manufacturing Company (Canada) Limited, Galt, Ontario

CIRCLE 219 ON READER SERVICE CARD

CIRCLE 220 ON READER SERVICE CARD →


Steel

PHOTOGRAPH BY PAUL WELLER

THE FINER TOUCH

Accuracy. By a steelmaking specialist. Ladle a sample. Test. Check again and again ■ Much may depend on tiny pellets of alloying metal in a furnace of molten steel. The strength of a bridge or a fractionating tower. The corrosion resistance of a processing vessel. Accuracy is essential to the skilled builders of these vital projects. ■ And accuracy is a characteristic long associated with Lukens—in producing the highest-quality carbon and special-duty plate steels and head shapes. In researching the best steels for difficult applications. The Lukens Application Research team would welcome the opportunity to work with your engineers on problems that involve designing with plate steels. Please write, or call collect, Manager of Application Engineering, 41-B Services Building, Lukens Steel Company, Coatesville, Pennsylvania.

THE SPECIALIST
IN PLATE STEELS

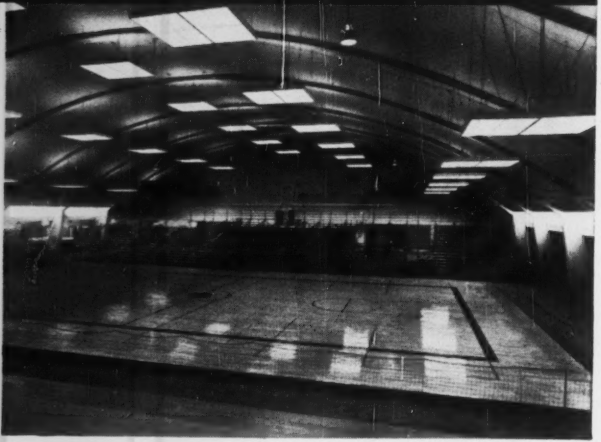
LUKENS
STEEL

Greater Design Flexibility makes

REINFORCED CONCRETE

both Contemporary and Functional

Residence Halls, and Dining Halls, University of California
Architect: Warneke & Warneke, San Francisco & Oakland
Structural Engineer: Isadore Thompson, San Francisco
General Contractor: Dinwiddie Construction Co., San Francisco



Field House, Northern Illinois State College, DeKalb, Illinois
Architects & Engineers: Perkins & Will, Chicago, Illinois
General Contractor: J. L. Simmons Co., Inc., Chicago, Illinois

The great difference in these building designs emphasizes the unlimited flexibility possible with reinforced concrete. Curve it . . . arch it . . . make it square . . . make it round—only reinforced concrete can give you such complete freedom for achieving structural beauty while meeting all functional requirements. Before you build, it will pay you to investigate the many design and economic advantages of this versatile construction material.

CONCRETE REINFORCING STEEL INSTITUTE
C.R.S.I.
FOUNDED 1924

Concrete Reinforcing Steel Institute
38 South Dearborn Street
Chicago 3, Illinois

1-61

Want More Information on Equipment, Materials?

Use ENR's inquiry card to order the publications you want all at once. The card is on page 255.

Construction Equipment

Tower crane

Specifications, reach charts, lifting tables, and speed ranges for the Mark 1-50 tower crane which hoists nine tons to heights of 250 ft and handles 2½ tons at a 123-ft load radius. Six pages. Bucyrus-Erie Co. **401**

Crawler tractor

Condensed specifications, assembly details, and accessories for Case Model 310 crawler tractor. 28 pages. J. I. Case Co. **402**

Wheel tractor

Specifications, accessory list, working range details for Case Model 350 wheel tractor. Accessories include backhoe, loader, scarifier, sweeper, post hole digger, winch and mover. 24 pages. J. I. Case Co. **403**

Overhead cranes

Specs for five basic cranes. Capacities from 3 to 300 tons. Illustrations of design features and auxiliary equipment. 20 pages. Milwaukee Crane. **404**

Crawler crane

Specifications working ranges and capacities for Insley WB excavator with 1¼-1½ cu yd capacities as crane, backhoe, dragline and shovel. 12 pages. Insley Mfg. Corp. **405**

Cranes

Special features of Unit-Coles cranes of 5- to 55-ton capacity. Three-page folder. Unit Crane & Shovel Corp. **406**

Crane excavator

Forty new features of the Bucyrus-Erie 22-B Series two crane excavator. Four pages. Bucyrus-Erie Co. **407**

Crane excavator

Folder of on-the-job photographs of Koehring's ¾-cu-yd 305 and 1-cu-yd 405 crawler rigs. Koehring Co. **408**

Crane excavator

Technical portfolios on P&H models 525, 535, and 550 crawler cranes; 52 capacity charts, 13 general dimension drawings, three crane range diagrams and numerous photographs. Harnischfeger Corp. **409**

Truck crane

Description, illustrations, specifications and special features of 20-ton HC-68A truck crane. 20 pages. Link-Belt Speeder Corp. **410**

Truck crane

Model 890 TC, claimed to be the world's largest truck crane, lifts 90 tons, carries 250 ft boom. Technical portfolio gives construction details, working range and lifting capacity charts for machine as crane, clamshell and dragline. Harnischfeger Corp. **411**

Truck crane

Upper works specifications, boom data, line pull and cable speeds for 35- and 40-ton truck cranes. Each eight pages. Insley Mfg. Corp. **412**

Trenchers

Six booklets describe a line of trenchers that dig 6 in. to 6 ft wide and as deep as 19 ft. Units are crawler or rubber-tire mounted. Parsons Co. **413**

Trencher

Vertical boom allows trenching close to walls, curbs, etc. Leaflet gives specifications. Digging width between 4 and 12 in. Century Engineering Co. **414**

Tractor attachments

Specifications of attachments and auxiliary equipment for D-15 and D-12 wheel tractors and H-3 and ED-3 crawler tractors. Includes loaders, backhoes, angledozers and rippers. Allis-Chalmers. **415**

Wheel excavator

Specifications for 160-ton Model 2000 wheel excavator with 3,600 cu-yd-per-hour digging capacity. Push button operation. Mechanical Excavators, Inc. **416**

Outdoor fork lift

Multipurpose high-lift with new front-end earth loader. Eight other attachments. Maximum height, 35 ft. Capacities and specifications. Six pages. Kwik-Mix Co. **417**

For More Information . . .

. . . Select the publications you want and circle the key numbers (shown at the end of each item) on the inquiry card at the end of this section.

Outdoor fork lift

Dyna-Luggar loader-carrier. Maximum 13-ft 10-in. height to fork heel. Load hold-down finger. Specs. Eight pages. Lull Engineering Co. **418**

Fork lift

Multipurpose high-lift, model 7-B. Lifts 4,000 lb to 30 ft. Holds 1,600 lb 20 ft out front. Specs. Eight pages. Lull Engineering Co. **419**

Road equipment

Photographs and construction details for Tarco line of road equipment including aggregate and material dryers and spreaders, sprayers and pots, buckets and dippers for tar and asphalt. 20 pages. Tarrant Mfg. Co. **420**

Road equipment

Specification sheets for the Seaman-Gunnison Line of construction equipment including the Model MTD Tankless Bituminous Distributor, Senior Model Bituminous Distributor, Models 660-6 and M5-6 utility scraper, Model 10-30 RD Duo Pactor and Model VR-72-G pull-type vibratory impactor. Seaman Corp. **421**

Paver

Construction features, mixing cycle and capacities of the 34-E Tribatch paver with a three-compartment mixing drum. Koehring Co. **422**

Spreader

Spreading of stone, ballast, gravel or mine tailings with a Jersey Spreader. Machine attaches to any tractor, has spread range of 10 to 13 ft, spread depth 1 in. to 12 in., handles 20 tpm. Four pages. Tractor Spreader Co. **423**

Road widener

Details on how the Model SJ-50 road widener and shoulder paver lays materials including tamped and leveled hot asphalt mixes. Specifications, and range details. 12 pages. Barber-Greene Co. **424**

Subgrader

Specification sheet for Blaw-Knox power-widened subgrader Model SWS-200 which handles widths of 12 to 28 ft. Blaw-Knox Co. **425**

Earthmover

"Profitable Production with Eimco" details Eimco 103, 105 and 106 tractors used as loaders, excavators and earthmovers. Eimco Corp. **426**

Don't buy trouble on the installment plan!

buy

CLOW cast iron pipe

the first cost is the LAST cost

You get what you pay for when you use Clow Cast Iron Pipe... generations of trouble-free service.

Costly repairs, torn up streets, loss of water, and interruption of service are held to a minimum. Quality pays off. Make your first cost your *last* cost.

JAMES B. CLOW & SONS, Inc.
201-299 North Talman Avenue
Chicago 80, Illinois

Subsidiaries:
EDDY VALVE CO. • Waterford, N.Y.
IOWA VALVE CO. • Oskaloosa, Iowa

CLOW CAST IRON PIPE

... Publications

Compactor

Construction and operating details and specifications for the Littleford 9S-14 9-wheel pneumatic tired, self-propelled roller which has a 3,225 lb wheel load and a 96 psi ground pressure. Littleford Bros., Inc. **427**

Aggregate plants

Universal aggregate production equipment including complete plants with from 50 to 1,000 tph capacity. 24 pages. Universal Engineering Corp. **428**

Crushers

Specifications, power requirements, weight, operating cycles and dimensions for all sizes of portable jaw crusher primary plants in five different types of machines. 12 pages. Pioneer Engineering. **429**

Secondary crushers

Dimensions, capacities and cutaway drawings of Model 16-50 secondary gyratory crusher with a 16-in. feed opening. Allis-Chalmers. **430**

Material processing

The Eagle line of washing and classifying equipment for sand, gravel, crushed stone and ore. Includes specs and capacity charts. 50 pages. Eagle Iron Works. **431**

Batch plant controls

Rex automatic controls for portable and stationary batch plants. Punched folders. Chain Belt Corp. **432**

Bucket elevators

Pictures and explains wide selection of bucket elevator systems. Dimensions, capacities, speeds and uses given. 84 pages. Webster Mfg. Inc. **433**

Portable conveyor

Dimensions for, and pictures of, Models 334 T and 334 portable trough conveyors and accessories for 60 to 90 cu-yd-per-hour capacities. Conveyor Systems, Inc. **434**

Concrete block maker

Production cycle of high-efficiency machine for making 8 x 8 x 16-in. concrete blocks. Four pages. Pratt and Whitney Co. **435**

Trucks

Specifications and design features of Studebaker trucks powered by GM diesels. Studebaker-Packard Corp. **436**

For More Information . . .

. . . Select the publications you want and circle the key numbers (shown at the end of each item) on the inquiry card at the end of this section.

Concrete carrier

Advantages of Agitor concrete carrying truck bodies, which carry 4, 6½ or 8 cu yds. Four-page folder S&M Mfg. Co., Inc. **437**

Concrete carriers

Specifications and measurements for 6-cu-yd side-dump Dumpcrete bodies. Four-page folder and flyer. Maxon Construction Co., Inc. **438**

Dump trailer

Specifications and construction details of the hydra-shift Pay-Pac dump trailer with 24-ft bed on 35-ft chassis. Spencer-Safford Loadcraft, Inc. **439**

Material feeder

Specification sheet for Model CL-1500 material feeder which hooks on to dump truck tailgate to feed curb machines. Miller Spreader Corp. **440**

Rock drills

Specifications, construction features and working photographs for five models of crawler rock drills. Ten pages. Gardner-Denver Co. **441**

Rock drilling equipment

Line of rotary three-cone air blast drill bits, piloted reamers, drill collars and related drilling equipment. Casing data shows bit sizes and clearances. 14-page illustrated booklet. Chicago Pneumatic Tool Co. **442**

Diamond drill

Interchangeable air-and-electric drive drills. For reinforced concrete, stone, tile, terrazzo and other hard materials. Diamond bits in 54 sizes, ¼ in. to 16-in. diameters. Manufacturer's line of accessories. Drill specs. Six pages. E. J. Longyear Co. **443**

Core drill

Specification sheet on a portable self-powered drill. Hole capacity with thin wall diamond bits is 2 in. to 8 in. Acker Drill Co., Inc. **444**

Horizontal drill

Earth drill bores under lawns, highways, walks, shrubbery, etc. without trenching. Drills holes 2 in. to 12 in. in diameter up to 200 ft for laying pipe or conduit. Four-page flier. Construction Machinery Co. **445**

Abrasive wheels

For grinding and cutting masonry and concrete. Cutting blades, sanders, saws, and safety coverings. 44 pages. Carborundum Co. **446**

Theodore M. Penker, Jr., Vice President, Penker Construction Company, Cincinnati, Ohio, (left) with Bert Melching, his Dodge Representative.

"We can bid lower because Dodge Reports do our prospecting for us"

"Without the advance notice of prospects for new work that Dodge Reports give us," says Mr. Penker, "we'd have to maintain a much larger sales force to provide the same kind of information. We figure that could add 5 to 10% to our cost of sales and advertising . . . which might make the difference between *losing* or *winning* an award!"

"We cannot afford to miss a single valuable lead, since we can't hope to get more than a few of the jobs we bid on. This is why continuation of our business at its present levels without Dodge Reports would be almost *impossible!*"

Mr. Penker's company was formed in 1880 by his grandfather to build homes and small factories. Today it employs 300 to 400 men on various projects ranging from buildings to sewage, water and power plants, bridges, viaducts and highways. It is one of the three largest firms in southwest Ohio doing both engineering and building types of construction.

"Over the *35 years* that we've been using *Dodge Reports,"* Mr. Penker says, "their primary value to us has been the important advance news of new projects they provide. But they give us other benefits, too. They let the sub-contractors know which jobs we are bidding in plenty of time to submit *their* bids to us! What's more, Dodge Reports help us to know a large part of our possible market as much as two years ahead, thereby enabling us to plan on either curtailing or expanding our overhead, personnel and equipment requirements. This can be a vital factor in an operation of our size."

Every day, Dodge Reports give Penker Construction the kind of advance information they need – in time to take action. Dodge Reports can do the same for your company – at surprisingly low cost – regardless of your size or scope. Send the coupon for further information. Or, consult your telephone directory for the Dodge office (in over 80 principal cities) nearest you.

F. W. DODGE CORPORATION

DODGE reports

119 W. 40th St., New York 18, N. Y.

F. W. DODGE CORPORATION
Construction News & Statistics Div., Dept. ENR61.
119 W. 40th Street, New York 18, N. Y.

I'd like to receive your free booklet, "How to Get More Business in the New Construction Field" and details on how Dodge Reports can help me increase volume and profits.

Name________________________

Company________________ Title________

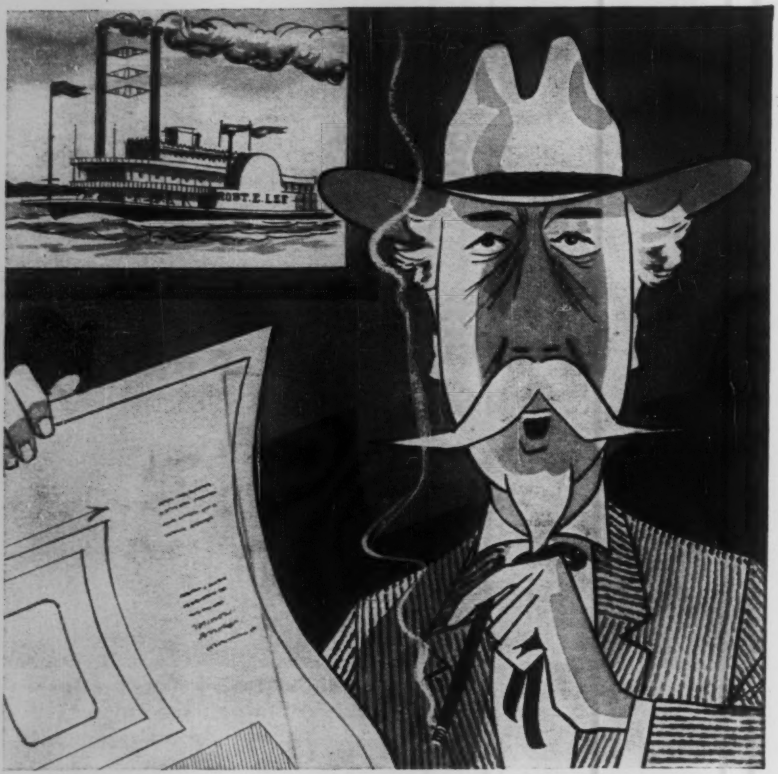
Address________________________

City____________ Zone______ State________

CIRCLE 225 ON READER SERVICE CARD.

Tracing Cloth or Drafting Film*?

Arkwright Makes Them Both



*Based on DuPont "MYLAR" polyester film.

CY F. FEEDWATER
FEEDWATER, BRINE ASSOCIATES
ATLANTA, GA.
MECHANICAL CONTRACTOR

When questioned on where he had laid out the piping for the new "Dixie Belle" power station, Cy Feedwater replied with conviction:

"On Arkwright, suh, on Arkwright. You know these mechanical specs are worked to death in the course of a job. They must be sharp and clear, resist discoloration and be as durable as time itself. I can depend on Arkwright — both tracing cloth and drafting film give me that perfect surface. Why don't you get piped in on the right line — Arkwright that is."

For perfect performance on cloth, specify the roll with the blue line — Arkwright. See for yourself the advantages of Arkwright's perfect coated surface on drafting film. Film available in several thicknesses. Both cloth and film in cut sheets or rolls. Write today for free samples.

Arkwright Finishing Division, Arkwright-Interlaken Inc., Fiskeville, R. I.

It's precisely right on Arkwright!

ARKWRIGHT
FINISHING DIVISION
Arkwright-Interlaken Inc.

. . . Publications

Power saw

One-man operated. Reciprocating blade, 10,000 strokes per min. With 16-in. or 20-in. blade. Width of cut: $\frac{3}{16}$ in. Specs. Eight pages. Wright Saw Division, Thomas Industries, Inc. **447**

Air tools

Diagrams and complete specifications for line of air tools for contractors, road builders, tunnel builders, etc. 48-page catalog. Thor Power Tool Co. **448**

Blast cleaning

Sandblast cleaning machines and accessories, for 90 to 100-psi air pressure. Also, personnel protective suits. Sand capacity and consumption tables. 38 pages. Sanstorm Mfg. Co. **449**

Portable electric plants

Gasoline and diesel-powered for ac and dc. 500 watts to 230 kw. Dimensions, capacities and weights of over 40 models. Accessories. Eight pages. Onan Division, Studebaker-Packard Corp. **450**

Diesel engines

Specifications, measurements, performance and fuel consumption charts and tables for White Model 40 diesel engines for crane-excavators. In 6- or 8-cylinder models with ratings of 385 to 800 bhp. Six pages. White Motor Co. **451**

Diesel engines

Dimensions and specifications for a line of air-cooled diesel engines rated between 18 and 66 bhp. Two booklets. Lister Blackstone Inc. **452**

Power wheelbarrow

Power Buggy holds 10 cu ft or ¾ tons of material. Moves at 4 mph on four wheels. Forward and reverse. Dumps mechanically. Platform type optional. Specifications given. Four pages. Aeroil Products Co., Inc. **453**

Concrete forms

Reusable wall forms. Steel frame and plastic-treated plywood facing combined into solid unit, easily unbolted for replacement. Reversible. 15 pages. Duraform Inc. **454**

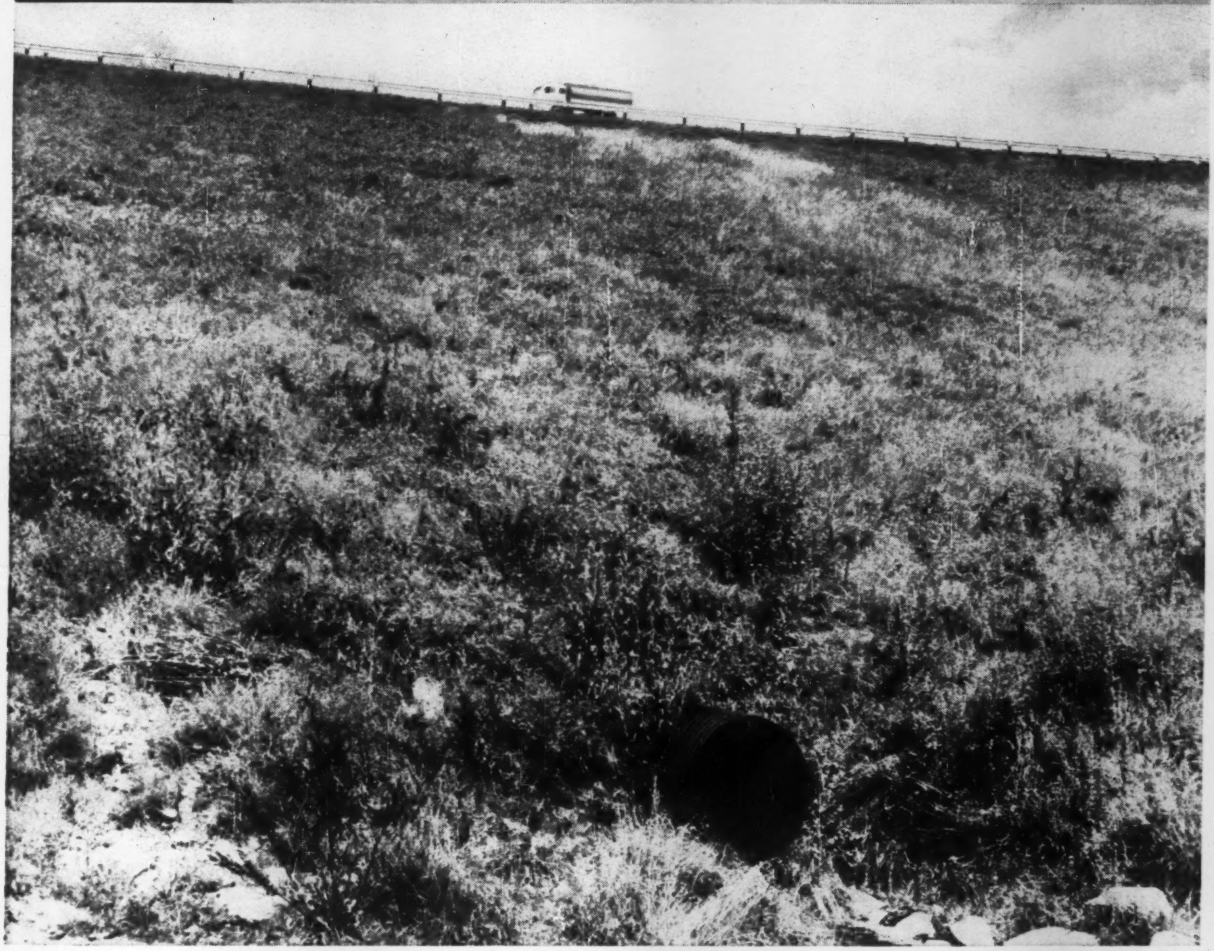
Concrete forms

Metal-framed, plywood, reusable forms, ties, accessories. Construction specialties and highway products. 55 pages. Universal Form Clamp Co. **455**

For More Information . . .

. . . Select the publications you want and circle the key numbers (shown at the end of each item) on the inquiry card at the end of this section.

CORRUGATED METAL CULVERT PIPE BY WHEELING

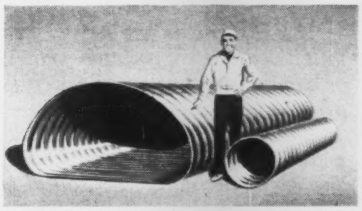


STANDS UP UNDER 100 FEET OF FILL!

Amazing as it seems, this 8-gauge, 54″ Wheeling Corrugated Metal Culvert Pipe is under 100 feet of fill . . . and can take decades of abuse!

Unlike heavy, rigid pipe, flexible Wheeling Culvert Pipe adjusts to changing pressures caused by shifting fill . . . uses the surrounding earth to help it carry the unusually heavy load of fill shown here.

Supplied in copper-bearing steel or copper-bearing pure iron . . . plain galvanized or bituminous-coated after galvanizing . . . with or without paved invert . . . Wheeling Corrugated Metal Culvert Pipe and Pipe Arch come in a wide range of gauges and diameters. Ask your Wheeling man for full details. Or write Wheeling Corrugating Company, Wheeling, W. Va.



Use Wheeling Pipe Arch (left) where headroom is limited; Wheeling Small-Diameter Culvert Pipe (right) for most roadside drainage.

WHEELING CORRUGATING COMPANY • IT'S WHEELING STEEL!

Warehouses: *Boston, Buffalo, Chicago, Columbus, Detroit, Kansas City, Louisville, Martins Ferry, Minneapolis, New York, Philadelphia, Richmond, St. Louis.* Sales Offices: *Atlanta, Houston, New Orleans.*

Magnetorque swings on this powerful P&H dragline keep a steady stream of trucks moving as it loads the 10-yard capacity units in 90 seconds each.

P&H
norco
No 23673

"Magnetorque swings give us 20% more

NORCO CONSTRUCTION COMPANY, Artesia, Cal.—

North H. Plunkett,
Norco's President, reports—

"Excavating is the key to profit or loss on this 2½ mile flood control channel job. After a detailed analysis of competitive units, we selected the P&H Model 655B dragline with long crawlers—primarily because of Magnetorque swings. The results are excellent—we are getting 20% better production than anticipated and the job so far is 30% ahead of schedule."

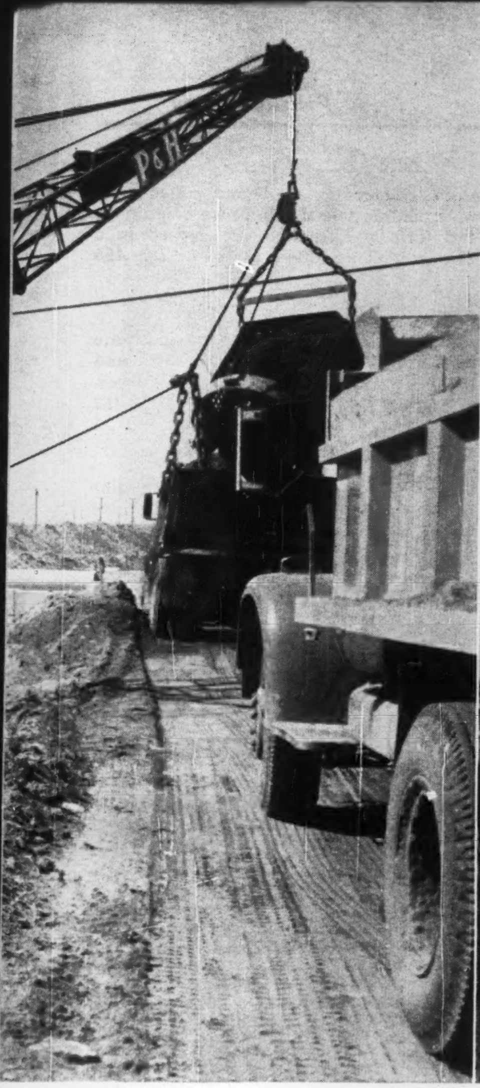
Norco Construction Co., is rushing a 2½ mile channel for Orange County Flood Control District. The job involves 400,000 yards of excavation—for the channel, a settling basin and a retention basin, to protect the billions of dollars invested in residential and commercial property as well as famous Disneyland and Knotts Berry Farm.

CIRCLE 228 ON READER SERVICE CARD

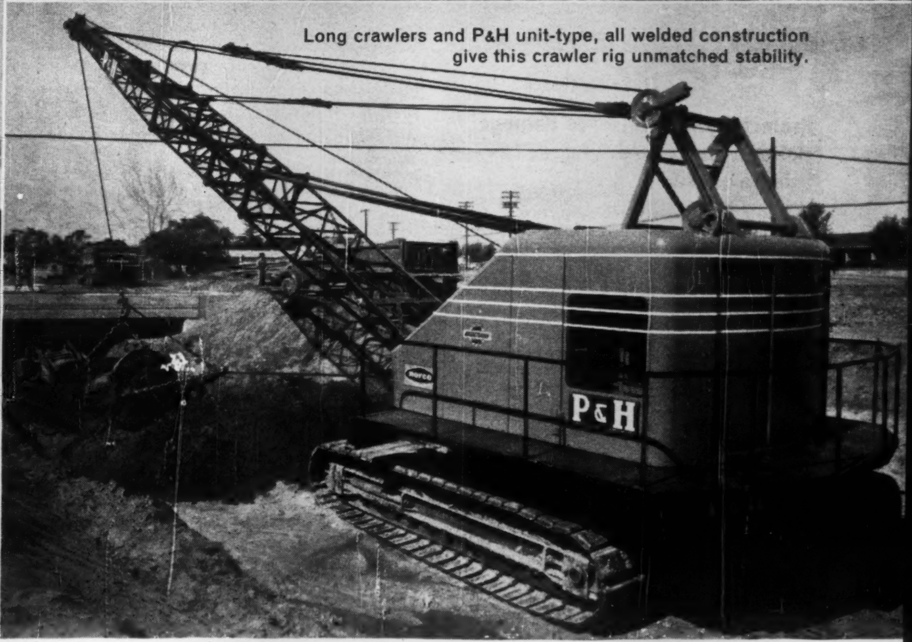
Norco's big P&H works from the center of the 50-foot wide excavation, swinging a 2½ yard bucket on its 60 foot boom to load 10 yard trucks on the embankment alongside. Material is wet sand and sticky clay which loads out at better than 3 yards per pass . . . filling the 10 yard trucks in only three passes.

Contractor Rigs Machine to Match Job Conditions

"With this type of job," Mr. Plunkett reports, "we felt it would be to our advantage to use a short boom and a larger dragline bucket. We are able to run our trucks on top of the embankment, close to the excavation. The 60-foot boom and the precision control of our P&H enables us to take advantage of the close quarters. We are very much impressed with the machine's ability to handle a 2½-yard bucket and still have so much stability. This is even more



When no hauling units are available, P&H drag stockpiles material as it makes a complete work cycle every 25 seconds.


Long crawlers and P&H unit-type, all welded construction give this crawler rig unmatched stability.

production...put us 30% ahead of schedule"

Contractor in Carbon Creek Flood Control Project, Anaheim, Cal.

remarkable when we discovered we were taking out more than 3 yards of material per pass."

Magnetorque Swings Are Key to Top Yardage

Frank McFall, operator, summed it up—"the Magnetorque swingers on this rig are 'head and shoulders' over friction clutches. They're fast . . . they're smoother when making my pass at the truck. And there is absolutely no jerking when I reverse the swing. I can make complete loading cycles in less than 30 seconds. It's even faster when I'm just stock piling and not loading. Another thing I've noticed is that I'm not nearly as tired at the end of the day as I used to be operating other rigs."

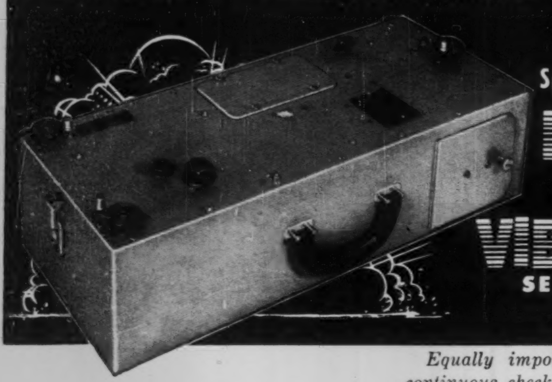
For complete information on this operation, write for Case History Report 134.

HARNISCHFEGER P&H
Milwaukee 46, Wisconsin
CONSTRUCTION & MINING DIVISION

As you plan ahead, plan on Magnetorque . . .
and choose the right machine for your work from 40 different models
. . . there's a P&H for every job! Write for "The Fabulous 40"

PORTABLE... ACCURATE... EASY to OPERATE

Sprengnether's BLAST AND VIBRATION SEISMOGRAPH



Protect against nuisance damage claims when pile driving or using explosives . . .

Pile driving and excavation or demolition explosions set up vibrations which owners of near-by buildings may claim caused property damage.

These claims can be unjustified or exaggerated, but are difficult to disprove without adequate supporting facts.

One of the strongest pieces of evidence in defense is recordings made on the job by a Sprengnether seismograph.

Equally important, your crew has a continuous check on the magnitude of vibrations resulting from their work, thereby, helping them safeguard against exceeding safe limits.

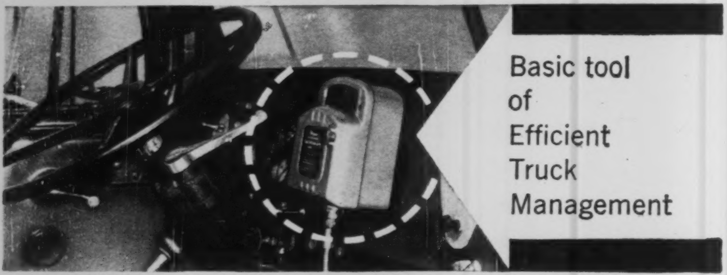
This seismograph is accurate to within 0.1%. It can be carried to any job site. Unit weighs only 38 lbs., — measures 25 x 10 x 8 inches. Requires no external power source.

No technical training is required to operate the instrument. It takes only minutes to set up.

Your best investment against future nuisance damage claims is a Sprengnether seismograph. *Write for complete information*

W. F. SPRENGNETHER INSTRUMENT CO., INC.
4567 SWAN AVE. • ST. LOUIS 10, MO.

CIRCLE 33 ON READER SERVICE CARD



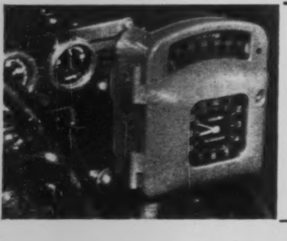
Basic tool of Efficient Truck Management

WAGNER®-SANGAMO

TACHOGRAPHS

on your trucks help cut down wasted time

When you equip your trucks with Tachographs, you get a complete report of each truck's daily run. Tachographs graphically record every foot of every trip . . . pinpoint all starts, stops, idling time and speed, on 12- or 24-hour disc charts, or on 8, 15, or 31-day strip charts. It costs only a few cents a day to use these "silent supervisors" to help you *plan less congested routes, cut unnecessarily long waits at scheduled stops, and eliminate unscheduled stops.* Wagner® Sangamo Tachographs are made in the U. S. A. Parts and service are readily available. Mail coupon for details on how TACHOGRAPHS can help improve your fleet operation.



Wagner Electric Corporation
6380 Plymouth Ave., St. Louis 33, Mo., U. S. A.

Please send FREE copy of Bulletin SU-140.

Name________

Company________

Address________

City & State________

We operate________ Vehicles (Number)

WS61-1

. . . Publications

Steel forms

Curb, combination curb and gutter, sidewalk, and flexible steel forms are described and form specifications are carried in a 20-page bulletin. Chain Belt Co. **456**

Form hardware

Complete line of concrete form hardware for bridges, dams, battered walls and buildings. Applications and specs. 68 pages. Williams Engineering Corp. **457**

Drive couplings

Complete engineering data on the Falk line of Steelflex couplings. 26 comprehensive charts and graphs cover numerous applications. 24 pages. The Falk Corp. **458**

Aluminum wheels

The economies resulting from the use of aluminum truck wheels are explained in a six-page folder. Alcoa. **459**

Brakes

Specifications for, and advantages of, Stopmaster heavy duty brakes for trucks and construction equipment and machinery. Six pages. Rockwell Standard Corp. **460**

Hoist and pulling machine

Features of, and uses for, 42 lb Tirfor multi-purpose hoist and pulling machine with 3,300 lb pulling capacity. Four-page folder. Tirfor. **461**

Hoists

Standard specifications for electric chain hoists. Covers both lug and hook-suspended types. Six pages. Hoist Mfgs. Association, Inc. **462**

Hand tools

Catalog of small hand and power tools, and testing equipment. 132 pages. Snap-On Tools Corp. **463**

Building Materials

Metal wall systems

Detail drawings of 1961 aluminum wall systems. Sealing and glazing characteristics. Four pages. Benson Mfg. Co. **464**

Curtain walls

Insulated metal curtain walls and Underwriters' Laboratories rated fire walls for inside and outside. Acoustically treated panels. Load tables and details. Specs. 16 pages. R. C. Mahon Co. **465**

For More Information . . .

. . . Select the publications you want and circle the key numbers (shown at the end of each item) on the inquiry card at the end of this section.

FAST—SAFE—STAY IN PLACE

Look easy? It is easy. And practical, too. Permanent, galvanized S-I-P (Stay-In-Place) steel forms for concrete bridge floors. No wood forms to remove. No shoring. No special tools. No safety nets or scaffolds required. All the work is done from above. S-I-P Bridge Forms fit between stringers. The minute they are set in place, you have a solid working deck, ready for reinforcing steel and concrete. Think of the construction time you save. For more information, write for Catalog No. 115-01.

GRANCO STEEL PRODUCTS CO., 6506 N. Broadway, St. Louis 15, Mo.
A Subsidiary of Granite City Steel Company

S-I-P BRIDGE FORMS®

GRANCO

GRANCO

TUFCOR®•CORRUFORM®•COFAR®
E/R COFAR®•ROOF DECK•UTILITY
DECK • GRANCO VIN-COR • S-I-P
BRIDGE FORMS®•PAVEMENT JOINTS
GUARD RAIL•FREE FLOW SUBDRAIN

Steel

CIRCLE 231 ON READER SERVICE CARD

Now . . . accurate locating of subsurface materials permits accurate estimating

Since G. S. C. first developed and introduced low-cost seismic analysis to the construction industry in 1957, it has created an entirely new technique of scientific job bidding.

Takes guesswork out of estimating. It gives you accurate and immediate information on presence or absence of bedrock . . . tells you its depth and rippability . . . helps you determine quantity and types of material to be excavated . . . locate borrow pits, and schedule suitable equipment for the job.

The G.S.C. MD-1 Seismograph* is the most precise *and the only fully proven* device of its kind on the market today.

The MD-1 is a simple, accurate, 16-pound instrument that can be carried wherever a man can go. Its reliability has been proved under the most difficult of conditions over a period of 5 years and by users in more than 26 nations of the free world.

Write or call TODAY for complete information on contract service, sales, or rental.

Contract Exploration Service

G.S.C.'s experienced engineering geologists will conduct complete surveys at your site at low cost, provide confidential reports of type, quantity, and depth of subsurface materials.

G. S. C.'s *ground-water geologists* will also help you in location and qualitative evaluation of buried aquifers and other problems involving underground water supplies.

Rental Plans are also available. Includes complete instruction manual. Lets you evaluate MD-1 Engineering Seismograph on the job before you purchase.

A real cost-saver for

- EARTHMOVERS
- EXCAVATING CONTRACTORS
- CONSULTING ENGINEERS
- AGGREGATES PRODUCERS
- MINING COMPANIES
- HIGHWAY ENGINEERS
- ARCHITECTS
- BRIDGE BUILDERS

*U. S. PATENT 2,980,884; CANADIAN PATENT 606,414

Geophysical
SPECIALTIES COMPANY
3110 Shores Blvd., Wayzata, Minnesota

. . . Publications

Steel joists

Series S and L, open-web steel joists, corrugated centering and formed roof deck, and accessories. Also electrified subfloor. Specs. 28 pages. Ceco Steep Products Corp. **466**

Built-up roofs

Felt, pitch, asphalt, sheathing and surfacing materials for flat and steep roofs. Applicable to nailable and non-nailable decks. Thermal values. Specs. 52 pages. Barrett Division, Allied Chemical Corp. **467**

Built-up roofs

Bonded roofs for nailable and non-nailable decks. Catalogued by length of guarantee, surface, incline, and construction materials. 28 pages. Philip Carey Mfg. Co. **468**

Roofing

Aluminum, copper, Monel metal, stainless steel. Battens, skylight and coping. Design drawings. Specs. Eight pages. Overly Mfg. Co. **469**

Laminated wood beams

Tangent, radial and tied arches; beams and purlins. Bowstring trusses and wood decks. For long and short-span construction. Load charts, joining details and specs. 20 pages. Rilco Laminated Products. **470**

Hardware for timber

Roof, wall and floor-framing connectors for joists and beams. Clamping plates and wood-to-steel connnectors. Recommended safe loads for hardware. 12 pages. Timber Engineering Co. **471**

Steel windows

Casement, projected and combination windows for residential, commercial and industrial buildings. Specs. 39 pages. Ceco Steel Products Corp. **472**

Steel windows

Projected, casement, awning and basement windows for commercial, residential and industrial application. Single-story windows and curtain walls. Specs. 38 pages. Hope's Windows, Inc. **473**

Aluminum windows

For home, school, office and factory. Some available with porclelain-enameled panels for curtain-wall construction. Detail drawings, specs. 35 pages. Ceco Steel Products Corp **474**

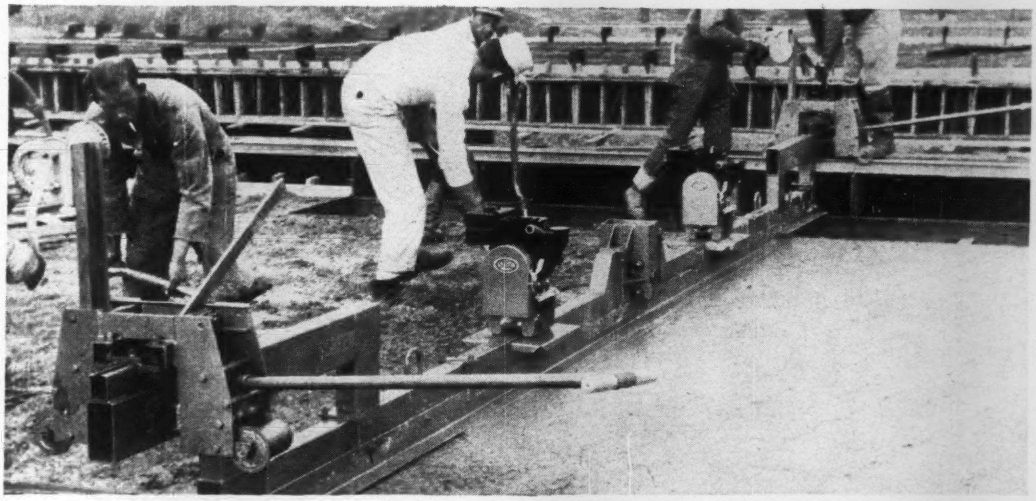
For More Information . . .

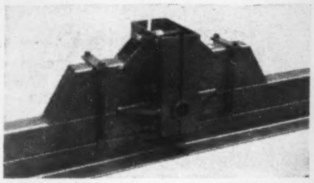
. . . Select the publications you want and circle the key numbers (shown at the end of each item) on the inquiry card at the end of this section.

NEW ADJUSTABLE CROWN VIBRATING SCREED

STOW

• saves as much as 50¢ per cu. ft. of concrete • often cuts production time in half





ADJUSTABLE HINGE ASSEMBLY allows a center crown of up to 3 inches.

Crown adjustments of up to 3 inches can be built right into the beam of this new Stow SASG vibrating screed. Just loosen the bolts on the adjustable hinge assembly, jack up the center, and retighten the bolts around the pivot tube. Quick and easy as that! And look at these other time and cost-saving features:

ALL-STEEL DOUBLE-FLANGE BEAM, in 20 to 50 ft. lengths, strikes off true-to-grade surfaces, thoroughly vibrates the mix, gives effect of two passes at once.

TWO ADJUSTABLE 3-INCH FLANGES can be raised or lowered along the length of the beam to maintain correct crown or flatness of screeding surface.

TWO ADJUSTABLE AMPLITUDE 3 HP GAS ENGINE POWER PAKS, with throttle speed controls, deliver the exact amount of vibration needed—all along the beam.

ADJUSTABLE ROLLER ASSEMBLIES, with 9:1 ratio winches, can be moved along beam for span adjustments of up to 6 ft. Levers raise beam 1½" for additional passes.

RUBBER MOUNTINGS on power paks and roller assemblies isolate vibration, minimize wear and tear, reduce maintenance costs.

Send the coupon below for the new Stow Bulletin #610-9.

STOW MANUFACTURING CO. Dept. B-2 19 Shear St., Binghamton, New York

Please send me Bulletin #610-9 on new Stow vibrating screeds.

NAME__________ TITLE__________

COMPANY__________

ADDRESS__________ CITY__________

STATE__________

STOW MANUFACTURING CO., BINGHAMTON, NEW YORK

Where good visibility means safety...

Specify BLAW-KNOX Electroforged® Steel Grating

A primary function of open flooring is to admit light and air to areas above and below its surface . . . to provide safer, more comfortable working conditions. Blaw-Knox Electroforged Steel Grating is designed to provide maximum open area.

Load requirements establish equal bearing bar dimensions for all types of grating, in equal service. Because it is Electroforged, Blaw-Knox grating can get maximum strength from crossbars only ¼ inch square. This means less obstruction to light and air, and safer, more comfortable working conditions above and below.

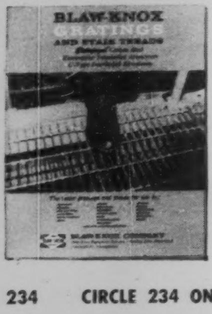
Visibility is only one way Electroforged grating increases safety. Sure footing is provided by the non-slip, twisted crossbar and a choice of either square, or serrated bearing bars. Electroforged grating is self cleaning, too. There are no joints or crevices to collect dirt and grease.

Electroforged grating also is available in other materials such as Cor-Ten and aluminum. Write for Bulletin 2581 for further information. Blaw-Knox Company, Pittsburgh 38, Pa.

Blaw-Knox Equipment Division

BLAW-KNOX

GRATING



Aluminum windows

Isometric and detail views of five basic windows—sliding, casement, reversible, projected and inswinging. Dimensions. Four pages. Benson Mfg. Co. **475**

Aluminum windows

Single-story window and curtain-wall systems. Projected, combination and reversible windows. Hardware, mullions. Specs. 24 pages. Hope's Window's Inc. **476**

Steel grating

Heavy duty. Resistance welded. In six standard patterns, each with bar depths from 1 to 4 in., and bar thicknesses of ¼, $\frac{5}{16}$, or ⅜ in. Safe load tables, aircraft landing loads. Eight pages. Grating Division. Rockwell-Standard Corp. **477**

Treads and gratings

Applications of open flooring. Surfaces and finishes. Specs, fastening data and safe-load tables. 24 pages. Blaw-Knox Co. **478**

Metal decks

Multipurpose steel M-decks. Beam depths to 7½ in.; spans up to 33 ft with normal roof loads. Load tables, acoustical coefficients. Specs. 15 pages. R. C. Mahon Co. **479**

Metal decks

Steel roof and floor decks, sidewalls, partitions. Rib depths to 2 in. Load tables, applications. Curb, eave, gable and ridge details. 15 pages. R. C. Mahon Co. **480**

Electrified subfloor

Cellular steel beams, M-floor, for structural floor combined with electrical raceway as subfloor. Maximum span 24 ft, depth to 7½ in. Tables of section properties and allowable loads. Specs. 16 pages. R. C. Mahon Co. **481**

Asphalt

Specifications and applications for a variety or plant-mixed asphalt paving materials including sheet and sand asphalt, hot-mixed, hot-laid and hot-mixed, cold-laid asphaltic concrete. Includes placement instructions. 20 pages. Texaco, Inc. **482**

Asphalt protection

Protective coating in red, green or grey colors for asphalt pavements in commercial and industrial installations, homes, tennis courts, recreational areas, highway media strips. Maintenance, Inc. **483**

For More Information . . .

. . . Select the publications you want and circle the key numbers (shown at the end of each item) on the inquiry card at the end of this section.

With 4 million yards of pure sand to move, this contractor's scrapers kept getting stuck in the soft footing. Then he replaced eight push-crawlers with four Michigan Dozers. RESULT:

Production up 40%... dozer cost down 65%

When Holloway Construction Company, Livonia, Michigan, won a contract for 7.8 miles of Interstate Highway 94, running through sand dunes and swamps alongside Lake Michigan, they were faced with having to move 4 million yards of almost pure sand. Should they use draglines and haul units . . . or utilize an already-available fleet of 26 self-propelled scrapers? Economics dictated the scrapers.

Fill production bogs down

"Right away we ran into trouble," reports General Supt Francis Morrell. "As soon as our scrapers would pull onto the fill, they'd bog down. Eight crawlers, assigned to spread, pull compactors and help out stuck scrapers, proved too slow to keep things moving. Also, operating in high gear was skyrocketing track costs."

"Then we replaced the eight 45,000 lb crawlers with four 57,770 lb Michigan Model 280 Tractor Dozers," Mr. Morrell continues. "Within a week, the rubber-tired units had increased production on the fill by 40% . . . and, reduced overall dozer fleet owning and operating costs by 65%."

Fast push clears traffic jam

According to Holloway officials, Michigan speed was the major factor in increasing production. Before, crawlers were too slow to reach scrapers before they became stuck. Now, the Michigans are able to "pick up" loaded haul units as they enter the work area . . . and travel with them down the fill as they *dump and spread at speeds up to 8 mph*. Thus, a scraper is boosted through its entire dump cycle and off the fill—a distance of about 350 ft—in just 65 seconds, Michigan's return takes only 45 seconds. Meanwhile, the Dozer's big 29.5-25 tires compact the fill both ways . . . attain 95% Proctor without the use of special equipment.

Where scrapers are on long hauls, up to 1½ miles one-way, cross-section measurements show each Michigan Tractor Dozer spreading and compacting between 6,000 and 7,000 pay yds per 10 hour day. *On short scraper hauls, 500 ft one-way, each Michigan spreads up to 20,000 pay yds per day.*

"We find Michigan maintenance simple and availability excellent," reports Supt Morrell. "Their speed in boosting scrapers—plus their ability to stay clear of incoming haul units—has eliminated all congestion on the fill. We feel our four Michigans have given us a new approach to fill spreading and compacting!"

Michigan is a registered trademark of

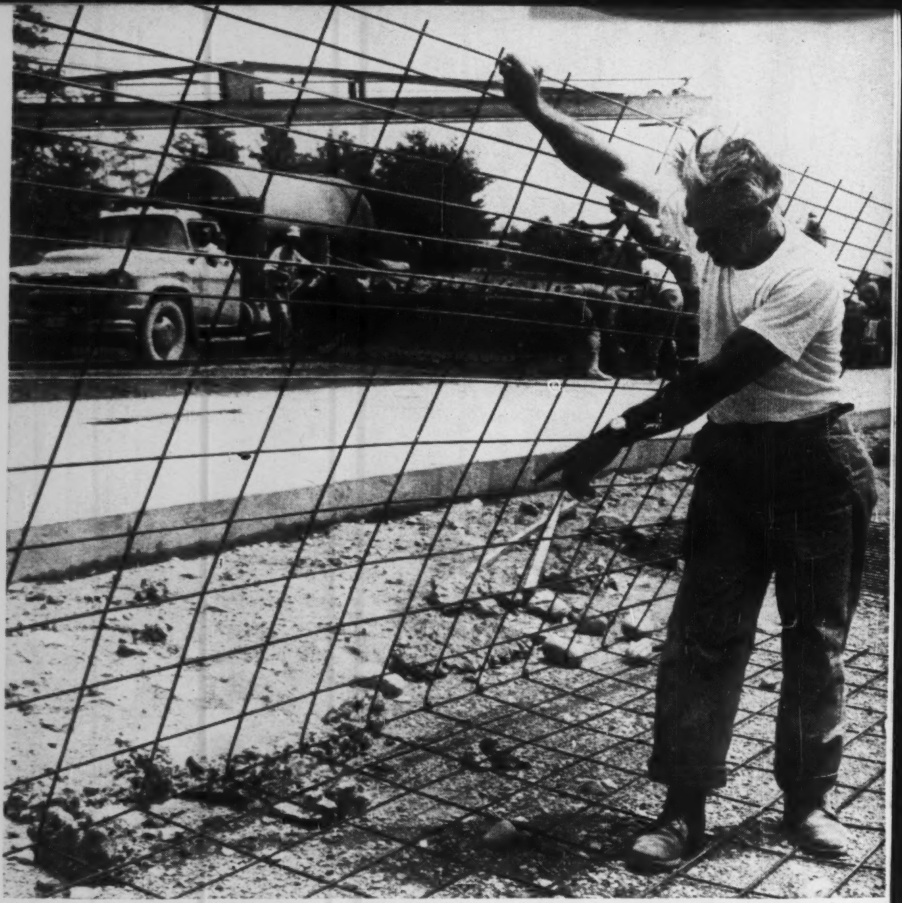
CLARK EQUIPMENT COMPANY

Construction Machinery Division

CLARK® EQUIPMENT

2401 Pipestone Road
Benton Harbor 24, Michigan
In Canada:
Canadian Clark, Ltd.
St. Thomas, Ontario

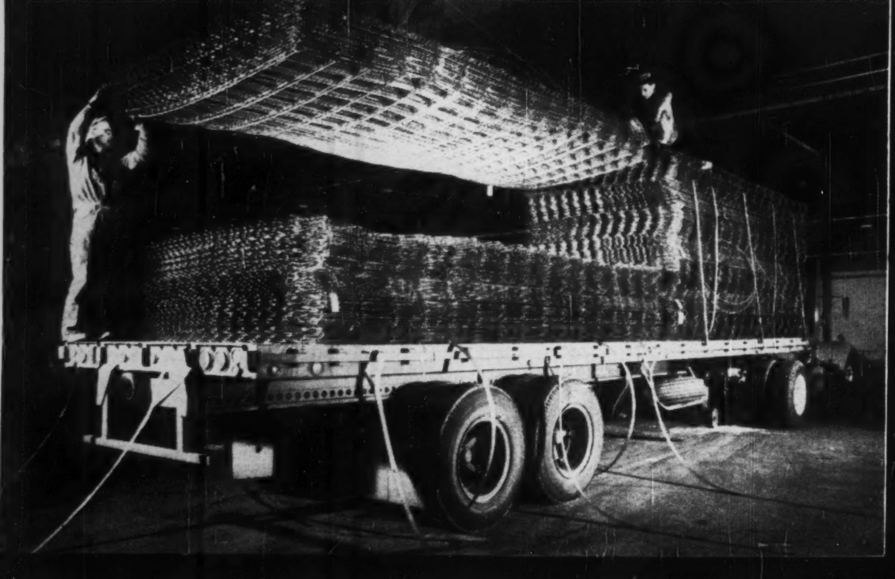
CIRCLE 235 ON READER SERVICE CARD



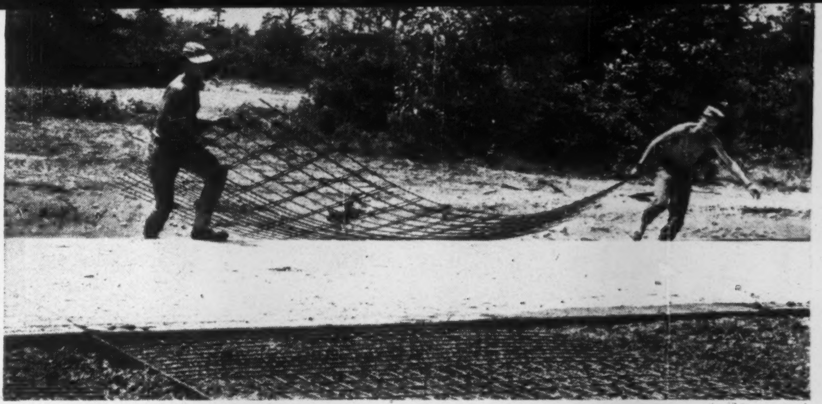
New Hinged Road Fabric from Pittsburgh Steel folds in slightly more than half the fabric's full width. Here in Glens Falls, N.Y., where Torrington Construction Co. of Connecticut is building a 14-mile strip of the $275-million Northway, Job Superintendent Patrick J. DiNatale shows how new fabric folds along hinge running length of the sheet.

Pittsburgh Steel's New Hinged Road Fabric Big Success On New York State's Northway

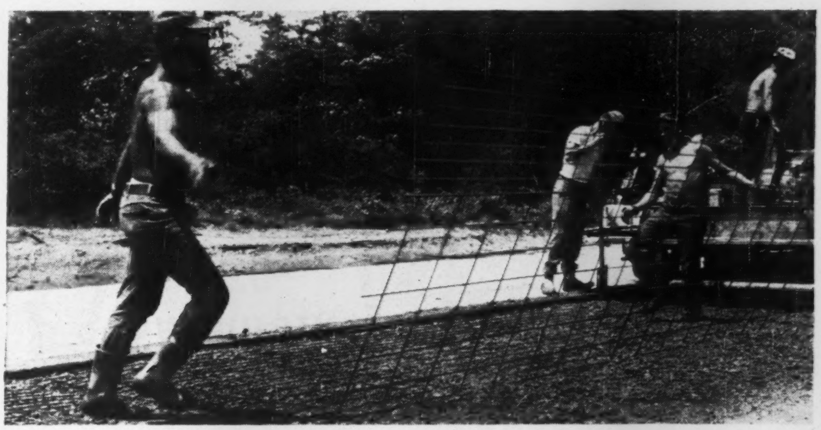
Contractor Saves About One-Third Installation Time



Ready to go at Pittsburgh Steel's Monessen, Pa., plant is a flat-bed truck loaded with new Hinged Road Fabric. Ordinary road fabric requires special cradling equipment and extra handling. Not so with Pittsburgh Steel's new Hinged Road Fabric: it's shipped folded flat and in weights up to 40,000 pounds per truck (depending on size and style), twice that of ordinary fabric. Shipments to Glens Falls took only a day.



On the job in Glens Falls, N.Y., a section of Hinged Road Fabric is handled easily and quickly by just two men.



Down goes Hinged Road Fabric in just seconds—and as flat as a living room rug

A revolutionary new road fabric from Pittsburgh Steel Company simplifies shipping, speeds handling and cuts installation time on roadbuilding jobs by as much as one third.

The new product, called Hinged Road Fabric, provides the steel backbone for a 14-mile strip of New York State's gigantic, $275-million Northway linking Albany with Canada.

Hinged Road Fabric features an off-center hinge running lengthwise on each section. Roadbuilders using this product—one of several being introduced by Pittsburgh Steel—cite its built-in benefits during:

- **Shipping**—Because Hinged Road Fabric's novel hinge permits folding in slightly more than half the fabric's full width, it can be stacked easily within the eight-foot width limit of a truck bed or gondola. This makes special cradle trucks and cradling equipment unnecessary.

As a result, trucks can be loaded to capacity (subject to state weight restrictions)—up to twice the weight possible with ordinary fabric.

- **Handling**—A single section of Pittsburgh Steel Hinged Road Fabric can be handled easily by two men instead of the four usually required for unwieldy ordinary sheets.
- **Installing**—Because the sheet is not bent during shipping and stacking, new Hinged Road Fabric lies flat when installed.

At Glens Falls, N.Y., where 800 tons of Hinged Road Fabric were installed on the four-lane, 175-mile Northway, Torrington Construction Co.'s veteran roadbuilders added their stamp of approval.

Patrick J. DiNatale, the Connecticut firm's job superintendent, was especially enthusiastic about the one-day service on Hinged Road Fabric truck shipments from Pittsburgh Steel's Monessen, Pa., plant.

"We get terrific service from Pittsburgh Steel," said Mr. DiNatale. "It takes just one day for a shipment to get here.

"Ordinary fabric usually takes a week to ten days to arrive because it's handled by truck, rail and then truck again. That's because many counties and cities won't permit trucks with overhanging loads to pass through.

"Pittsburgh Steel's fabric is handled only once—and in one day in loads up to 40,000 pounds, not 20,000."

Torrington's field engineer, Robert B. Cunningham, is enthusiastic about Hinged Road Fabric's fast, easy handling. He said:

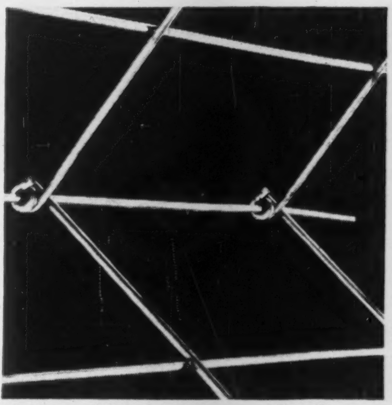
"I estimate that at the end of a working day this Pittsburgh Steel fabric saves us about one-third the installation time required with ordinary fabric."

The man directly in charge of the fabric's installation—Paving Foreman John Picciocca who has worked with all brands of road fabric for the last 12 years—had this to say:

"What really sold me on Hinged Road Fabric is that it doesn't poke through the concrete while it's taking a set. That's a big problem with ordinary fabric. When that happens, you either have to cut the wire or repave the spot to cover the wire. That's murder on costs."

If you're in the roadbuilding business, you'll be dollars ahead—like Torrington—when you let Hinged Road Fabric provide fast, economical reinforcement on your next job.

Contact your nearest Pittsburgh Steel Products sales office listed here.



Unique hinge is the result of two years' development work.

Hinged Road Fabric

Patents applied for

Pittsburgh Steel Products

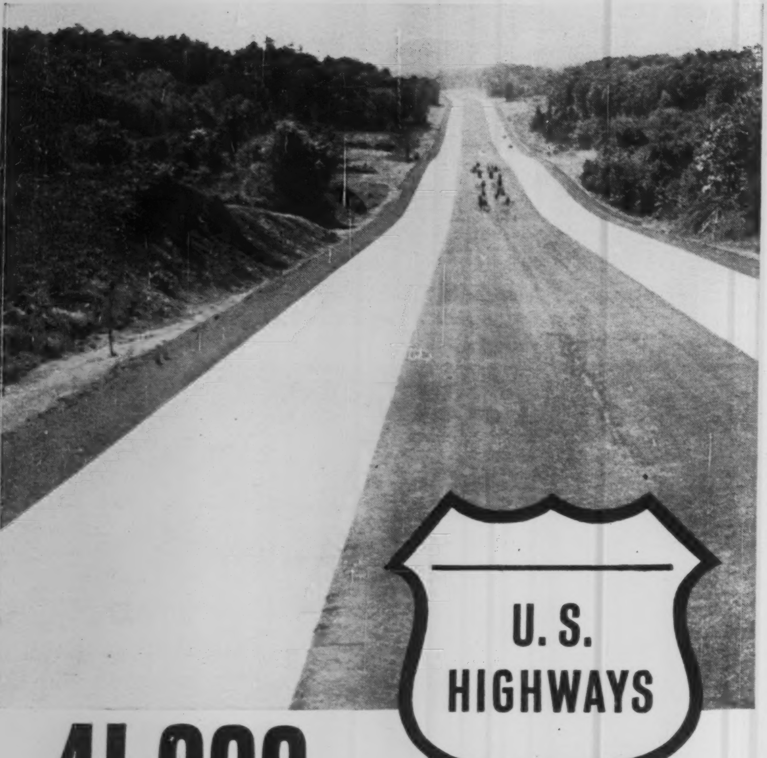
a division of **Pittsburgh Steel Company**

Grant Building • Pittsburgh 30, Pa.

DISTRICT SALES OFFICES

		Dayton	Los Angeles	Pittsburgh
Atlanta	Cleveland	Detroit	New York	Tulsa
Chicago	Dallas	Houston	Philadelphia	Warren, Ohio

CIRCLE 237 ON READER SERVICE CARD



41,000 miles of road...

where can you use a dredge?

The Interstate Highway System offers challenges for road builders all across the nation... especially if the job involves building a road through a swampy area. Handling unstable earth materials calls for consideration of a hydraulic dredge. And cost-conscious contractors prefer Ellicott Dredges to obtain stable fill at the lowest cost per cubic yard.

Particularly applicable to road-building in low-lying, boggy areas, Ellicott "DRAGON®" Model Hydraulic Dredges dig, transport, and relocate water bound earth solids in one continuous economical operation. Designed to be transported overland from job to job by truck or lowboy, their matchmarked part construction permits easy field assembly, which eliminates long periods of downtime, a primary problem in meeting contract obligations.

ELLICOTT DREDGES

ELLICOTT MACHINE CORPORATION, Baltimore 30, Maryland, U.S.A.; Ellicott-Brandt, Inc., Baltimore, Maryland; Ellicott Fabricators, Inc., Baltimore, Maryland; McConway & Torley Corp., Pittsburgh, Pennsylvania; Timberland-Ellicott, Limited, Woodstock, Ontario, Canada; Dragues Ellicott France, Paris, France; Dragas Ellicott do Brasil Ltda., Rio de Janeiro, Brazil; Ellicott de Mexico, Mexico City, Mexico.

Successors to the floating dredge business of the Bucyrus-Erie Company and the American Steel Dredge Co. Complete engineering, design and construction service.

2295

ELLICOTT MACHINE CORPORATION
1603 Bush Street • Baltimore 30, Maryland

Send me a copy of Bulletin 980, describing the complete line of DRAGON model dredges.

Name______________________________
Firm______________________________
Address____________________________
City_____________Zone________State________

Pozzolith

Case studies of 25 major dams in U. S. describe role of Pozzolith as a concrete improving admixture. 48-page booklet. Master Builders Co. **484**

Pozzolith

Use of Pozzolith in portland cement concrete airport runways. 20 pages. Master Builders Co. **485**

Molded water seals

Flat, labyrinth and cellular-shaped strips of vinyl plastic. Detail drawings, specs. Eight pages. Water Seals, Inc. **486**

Enamels

Supplement to "Lead in the Ceramic Industries." Properties, applications of new low-temperature (1,000 F) porcelain enamels for steel coating. Four pages. Lead Industries Assoc. **487**

Protective coating

Tile-X spray or brush-on epoxy coating. Adheres to most surfaces. Chemical physical properties, six pages. Colors and specs, four pages. Steelcote Mfg. Co. **488**

Bricks and tiles

Color charts, specs, sizes and shapes of structural and facing tiles and bricks. Eight pages. Hanley Co. **489**

Metal Lath

New and revised technical bulletins. Fire resistance, sound insulation, construction details, other data. Metal Lath Manufacturers Association. **490**

Reinforcing bars

High-strength concrete-reinforcing bars, marked with size and grade. Tensile and yield strengths. Four pages. Laclede Steel Co. **491**

Masonry wall ties

Brick headers vs. continuous metal ties for tying together wythes of brick-and-block walls. Investigation of flexural strength (vertically), compressive strength and watertightness. 44 pages. Dur-O-waL Division, Cedar Rapids Block Co. **492**

Threaded fasteners

Specs and selector guide for threaded rods, clevises, turnbuckles, coupling and sleeve nuts, and accessories. In bolt diameters of 1¾ in. and up. Four pages. Joseph Dyson and Sons Inc. **493**

For More Information . . .

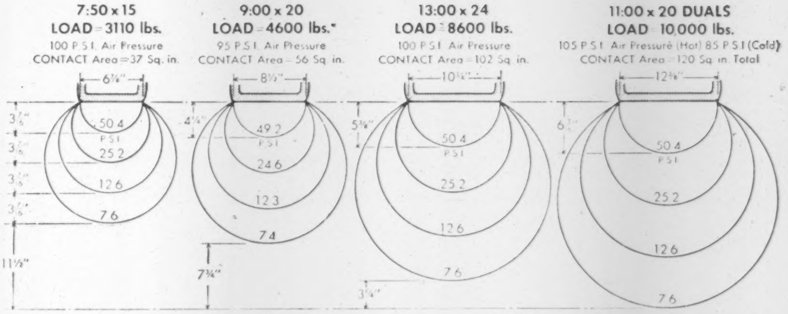
. . . Select the publications you want and circle the key numbers (shown at the end of each item) on the inquiry card at the end of this section.

30-ton BROS Roller changes tire pressure without stopping

This big pneumatic-tired roller is designed to match the effect of heaviest dual-wheel over-the-road trailer trucks. On job after job, it exceeds specified densities with little variation. And now, new "air-on-the-run" feature lets operator vary the tire pressures from 30 to 100 psi without stopping.

RESEARCH REVEALS NEW FACTS . . .

The truth about compaction


7:50 x 15
LOAD = 3110 lbs.
100 P.S.I. Air Pressure
CONTACT Area = 37 Sq. in.
9:00 x 20
LOAD = 4600 lbs.*
95 P.S.I. Air Pressure
CONTACT Area = 56 Sq. in.
13:00 x 24
LOAD = 8600 lbs.
100 P.S.I. Air Pressure
CONTACT Area = 102 Sq. in.
11:00 x 20 DUALS
LOAD = 10,000 lbs.
105 P.S.I. Air Pressure (Hot) 85 P.S.I (Cold)
CONTACT Area = 120 Sq. in. Total
6⅞"
8½"
10¼"
12⅜"
3 7/16"
3 7/16"
3 7/16"
3 7/16"
11½"
4¼"
7¾"
5⅜"
3¼"
6 3/16"
50.4
PSI
25.2
12.6
7.6
49.2
PSI
24.6
12.3
7.4
50.4
PSI
25.2
12.6
7.6
50.4
PSI
25.2
12.6
7.6

To accomplish its purpose, compaction must be *adequate* . . . and it must be *uniform.*

If it fails in either respect, heavy truck traffic will further increase the density . . . *but that additional compaction will not be uniformly distributed.*

Result: channelized deformations which lead to future repairs.

Roller effectiveness requires 3 factors: 1) enough Wheel Load (gross roller weight divided by number of wheels . . . 2) sufficient Ground Contact Area (tire surface under load that's in contact with ground . . . and 3) adequate Ground Contact Pressure.

To do its job properly, your roller must have a combination of Wheel Loads, Ground Contact Area, and Ground Contact Pressure that *equals* or *exceeds* that of the heavy over-the-road traffic which follows it . . . and as the above diagram shows, this is a lot greater than most engineers realize.

Two additional factors tend to increase the compactive effect of heavy trucks: the heat-rise which increases tire pressure after a few miles of high-speed travel, and the vibration which increases tendency toward consolidation.

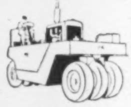
Write for the full, documented engineering data on which these important new findings are based. *They will very probably influence your future plans.*

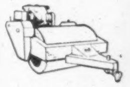
BROS

BROS *Incorporated*

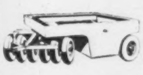
1057 Tenth Ave. S.E., Minneapolis 14, Minnesota • (BROS products also manufactured in Australia and Brazil)

ROAD MACHINERY DIVISION


30-TON SELF-PROPELLED ROLLER


VIBRA-PACTOR

25,000 LB. SELF-PROPELLED ROLLER

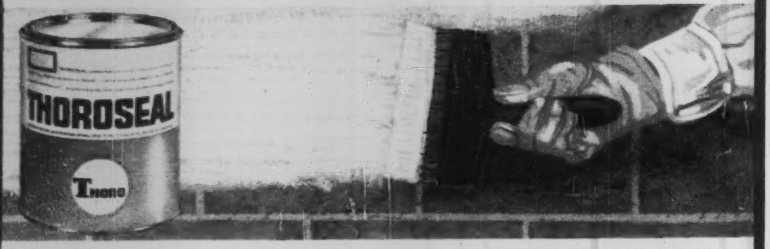

10 AND 15-TON ROLLERS

SHEEPSFOOT TAMPERS

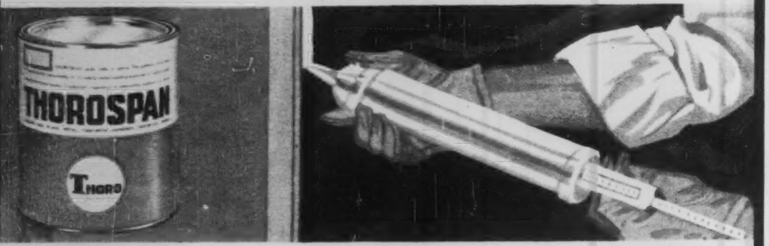
35-100 TON ROLL-O-PACTOR

For every type of construction—weatherproof with products of The

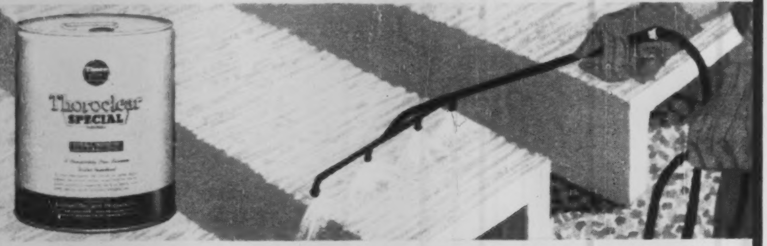
THORO SYSTEM



Cementitious Thoroseal keeps water out of all masonry and concrete. Penetrates deep into pores, bonds compatibly. Stops erosion, spalling, corrosion. Can't flake or peel. Actually becomes part of the wall!



Thorospan polysulfide sealant calks curtain walls with long-life bond. Waterproof! Shockproof! Flexes without fatigue. Compresses to half, expands to twice normal size without disturbing bond.



Silicone water emulsion Thoroclear Special sprays on a colorless protection for concrete. Prevents freeze-thaw damage. Keeps concrete clean. Stops erosion and cracks. Seals water out—adds years of life.

WATERPLUG
Thoro
THORO SHEEN
RW7
D-J
GROUTING MORTAR
THORO BOND

WATERPLUG, a perfect hydraulic cement, stops leaks instantly. THOROSHEEN acrylic-base paint decorates masonry, concrete. D-J MORTAR grouts and seals the porous joints of tile, smooth brick. THOROBOND liquid bonds plaster firmly to slick concrete surfaces.

- Ask for free specification guide to all Thoro System products.

STANDARD DRY WALL PRODUCTS, INC.
DEPT. E-3, NEW EAGLE, PENNA.

. . . *Publications*

Driven fasteners

Nails, staples and pins (⅜ to 2 in. long) and 100 guns to drive them. 16 pages. Spotnails, Inc. **494**

Pole and pile protection

Cunilok cupro-nickel shields for protecting creosoted piles and poles from borer attack. Assembly details, specifications and job applications. Six-page folder. Waterbury Rolling Mills, Inc. **495**

Installed Equipment

Steel buildings

Pre-engineered warehouses, factories, schools, and offices. Various roof pitches, flat and bowstring trusses. Insulated panels. Door and sash details. Drawings, specs. 24 pages. Brookville Mfg. Co. **496**

Rolling steel doors

Rolling steel doors, grilles and shutters. Hand and power operated; standard or Underwriters' Laboratories labeled models. Detail drawings, dimensional data, specs. 16 pages. R. C. Mahon Co. **497**

Metal doors

Hollow metal doors, frames and entrances. New designs resulting from Underwriters' Laboratories fire tests aimed at cutting costs. Detail drawings, dimensions, specifications given. 19 pages. Overly Mfg. Co. **498**

Aluminum doors

Detail drawings and hardware for three aluminum swinging doors. Four pages. Benson Mfg. Co. **499**

Compressor stations

Design and operations features of "Vee-Pac" packaged compressor stations in 10 and 12 cylinder units rated at 825 and 1,000 bhp. Clark Bros. Co. **500**

Air conditioning, heating

Line of steam and water heaters fired by various types of fuels. Compatible radiators, packaged air conditioners. Eight pages. Crane Co. **501**

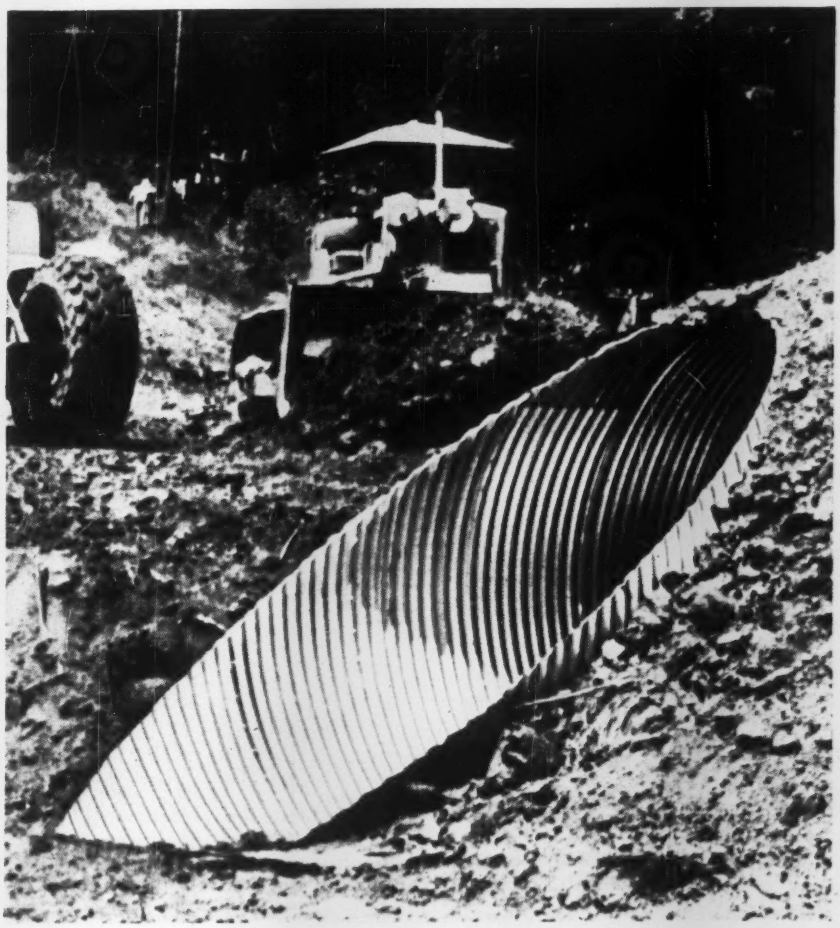
Air conditioning, heating

How to plan a make-up air system to replace exhausted air. For buildings in areas with design temperatures below 35 F. Temperature-rise tables for gas-fired duct furnaces. Eight pages. Reznor Mfg. Co. **502**

For More Information . . .

. . . Select the publications you want and circle the key numbers (shown at the end of each item) on the inquiry card at the end of this section.

This mark tells you
a product is made
of modern, dependable Steel.



Road Project: Madison County, Iowa **Culvert Fabricator:** Midwest Culvert Company

The old plank bridge was falling down — so they replaced it with a steel culvert

It would have cost Madison County, Iowa, too much to repair the wooden bridge that used to be here on this secondary road. So, they tore it down and replaced it with an 84-inch beveled end 8-gage galvanized steel pipe. Then they graded the road over the pipe. It took only a half day to install this drainage pipe made from USS Corrugated Galvanized Steel Culvert Sheets. So they saved quite a bit of construction time and money. And they expect the pipe to last 50 years—without any maintenance. For more information about USS Corrugated Galvanized Steel Culvert Sheets for drainage pipe, send for our free booklet, "Culvert Sheets for Metal Drainage Products." Write United States Steel, Room 6295, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

United States Steel Corporation • Columbia-Geneva Steel Division • Tennessee Coal & Iron Division • United States Steel Supply Division • United States Steel Export Company.

USS **United States Steel**

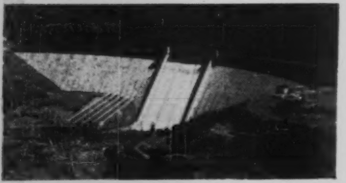
TRADEMARK

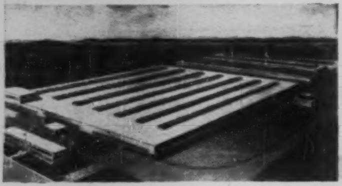
Lubrite®

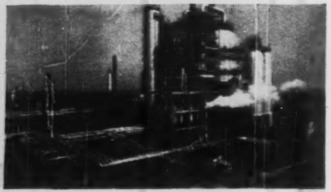
Self Lubricating

EXPANSION PLATES & BUSHINGS

- Permit simplified designs
- Cut construction costs
- Eliminate maintenance
- Low coefficient of friction

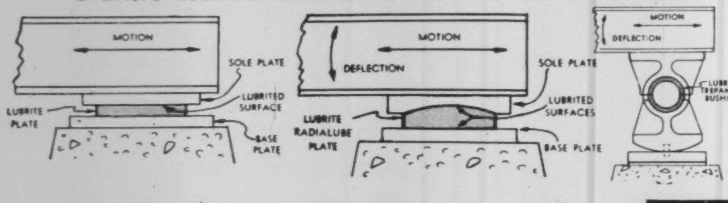






Lubrite offers positive assurance of self lubricating security in all installations where expansion, contraction and/or rotation are factors.

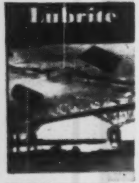
3 BASIC LUBRITE ASSEMBLIES FROM MANY AVAILABLE



SEND FOR THIS IMPORTANT AND VALUABLE LITERATURE —

Manual No. 55 contains complete information, technical data and specifications about Lubrite Expansion Plates and Bushings for bridges, buildings, refineries, atomic energy and chemical processing equipment applications.

Manual No. 56 covers Lubrite bushings, bearings and washers for use in machinery, industrial equipment, hydro-electric projects, missile and atomic energy and high temperature applications.



LUBRITE DIVISION
MERRIMAN BROS., INC.
185 Amory Street, Boston 30, Mass.

CIRCLE 242 ON READER SERVICE CARD

. . . Publications

Air conditioning

A 24-page bulletin contains descriptions, illustrations and design tables for combination light and air diffusers. Barber-Colman Co. **503**

Heater-ventilator

Data for selection of 102 industrial and commercial heating-ventilating units. Specs and tables for Torrivent line. 43 pages. Trane Co. **504**

Strip heaters

For heating ovens, process welding, outdoor control equipment and forced hot air, radiant and baseboard heating. Temperature ratings, electrical requirements and tables of average specific heats. 12 pages. Bryant Electrical Co. **505**

Roof cooling systems

Spray heads, piping and automatic controls distribute just enough water to wet entire roof. Evaporation cools roof, cuts inside temperatures 10 to 15 degrees. Four pages. April Showers. **506**

Roof ventilators

Four ventilator types—combined-explosion-control, adjustable venturi, centrifugal and combined-skylight. Details dimensions, performance and capacity tables, and noise and candlepower parameters. Specs. Eight pages. The Swartwout Co. **507**

Roof ventilators

Direct-drive centrifugal ventilators, 1/40 to ½ hp. Dimensions, ratings, detail drawings, specs. Eight pages. Industrial Division, American Radiator and Standard Sanitary Corp. **508**

Steel boilers

Low pressure oil-, gas- and solid-fuel-fired boilers . For 15-psi steam or 30-psi water. Ratings up to 102,850 sq ft for water at 150 Btu. Dimensions. Eight pages. Pacific Steel Boiler Div. of Crane Co. **509**

Plumbing, heating fixtures

Hospital plumbing fixtures, heating and air conditioning units. Specs on plumbing fixtures. 12 pages. Toilets, sinks bath and laundry tubs for industrial and commercial buildings. Eight pages. Crane Co. **510**

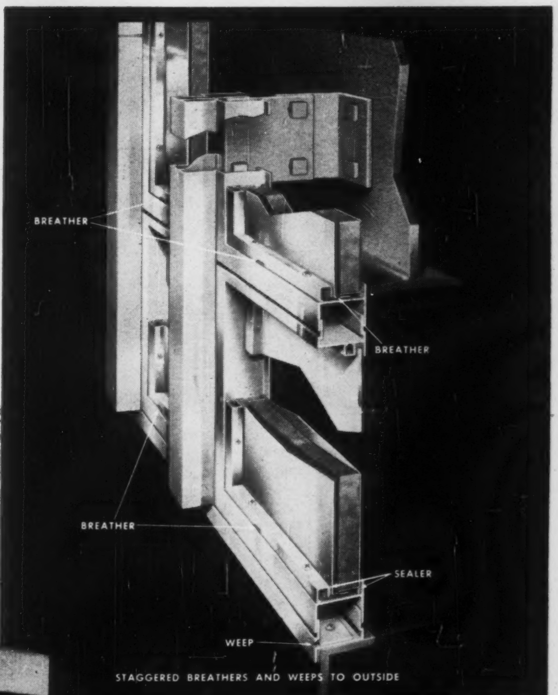
Concrete pipe

Reinforced concrete pipe for low-pressure applications and prestressed non-cylinder concrete pipe for high-pressure applications. Cen-Vi-Ro Pipe Corp. **511**

For More Information . . .

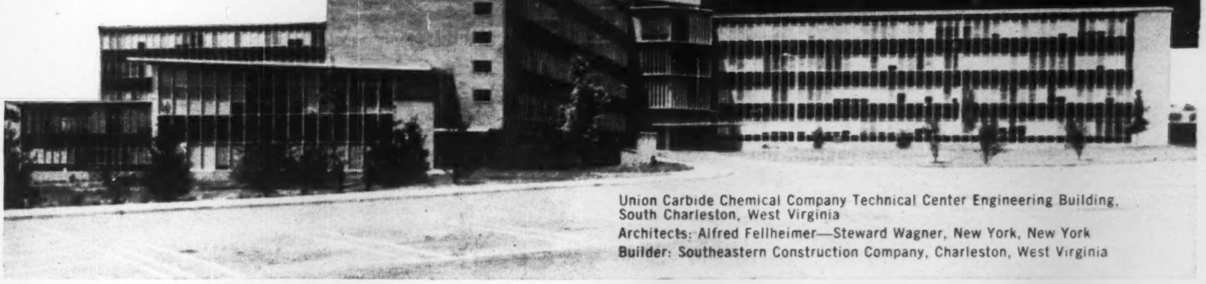
. . . Select the publications you want and circle the key numbers (shown at the end of each item) on the inquiry card at the end of this section.

This Series AV250 Bayley Vertical Curtain-Wall System, with 2½" deep mullion, accommodates any arrangement of insulating panels, glass or Bayley Aluminum — ventilated or fixed — Window units having channel frames, mounted directly into the sub-frame. Selection of types and depths of vertical mullions also available.



STAGGERED BREATHERS AND WEEPS TO OUTSIDE

Pre-Engineered for design flexibility, erection economy and performance...



Union Carbide Chemical Company Technical Center Engineering Building, South Charleston, West Virginia
Architects: Alfred Fellheimer—Steward Wagner, New York, New York
Builder: Southeastern Construction Company, Charleston, West Virginia

The Series AV250, used in this attractive Union Carbide Chemical Company Building, is one of TEN Bayley **pre-engineered** Curtain-Wall Systems . . . available in aluminum or steel and in depths of 1½" to 7½". Flexibility of these designs permits originality of wall treatment for individualized building appearance. By being pre-engineered, they more fully meet all functional requirements and facilitate your problems of holding to a budget. By working with Bayley, you gain the extra benefits of a financially responsible organization with complete manufacturing and erection facilities; and experienced curtain-wall engineering assistance available to you upon request. Write or call Bayley on your current or contemplated projects.

BAYLEY
ALUMINUM
Curtain-Wall Systems

The **WILLIAM BAYLEY** Company
Springfield, Ohio
Representatives in All Principal Cities

District Sales Offices:

SPRINGFIELD, OHIO 1200 WARDER ST. FAirfax 5-7301	NEW YORK 16, N.Y. 280 MADISON AVE. MUrray Hill 5-6180	CHICAGO 2, ILL. 105 W. MADISON ST. RAndolph 6-5996	WASHINGTON 5, D. C. 1426 "G" ST., N.W. STerling 3-3175

CIRCLE 243 ON READER SERVICE CARD

CIRCLE 244 ON READER SERVICE CARD→

Savings in engine costs alone make the "Euc" C-6 today's best tractor buy

In the Euclid C-6 you get the advantages of job proved power train components . . . the reliability of the GM 6-71 engine, Allison Torqmatic Drive and Euclid's famous planetary drive . . . that help keep downtime to a minimum. You get designed-in service accessibility that's unsurpassed by any competitive crawler . . . servicing or complete removal and replacement time is well below that required for comparable tractors.

You get a big advantage, too, in the lower cost of engine replacement parts . . . savings that cut your maintenance expense to the absolute minimum. For example, pistons and rings for a competitive engine are 162% higher in cost than for the GM engine; a water pump 243% more; a block 270% more; and replacement of a complete engine, from fan to flywheel, costs almost twice as much in the competitive crawler. These savings, plus faster repair and replacement times, are some of the reasons why owners have found the "Euc" C-6 is the lowest cost tractor in the 200 h.p. class.

EUCLID Division of General Motors
Hudson, Ohio
Plants at Cleveland and Hudson, Ohio
and Lanarkshire, Scotland

Full-power shift . . . fast-as-a-fox maneuverability . . . and greater over-all work-ability!

Have your dealer give you all the facts and figures on the C-6 . . . you'll find that in production and maintenance cost this "Euc" gives you a better return on investment.

C-6 service accessibility cuts replacement labor costs, too!

Assuming good shop conditions and experienced personnel, these are typical times for removal and replacement of components in the C-6 and another power-shift tractor of the same class:

Component	Man-Hours C-6	Man-Hours Competitor "C"
Radiator	3	10
Engine	8	14
Recoil system	3	20*
Drive Sprocket	4	9**
Track Frame	3	8

*requires 50-ton press
**requires 100-ton press and special tools

HOURS SAVED IN THE SHOP MEAN MORE WORK-TIME ON THE JOB!

GM GENERAL MOTORS

EUCLID

FOR MOVING EARTH, ROCK, COAL AND ORE

WHEN CONSTRUCTION JOBS CALL FOR SOIL COMPACTION

BARCO is the ANSWER!

When You're Figuring For The "Low Bid"—No other tool can give you the economy and dependability offered by Barco Rammers on high degree soil compaction for all kinds of projects—Highways, Freeways, Hydroelectric Power and Flood Control Dams, Airports, Bridges, Defense Sites, Buildings, and Housing Developments!

When You Have To Meet Tough Specifications—In test after test, Barco Rammers have demonstrated their ability to deliver 95% to 97.5% compaction (modified Proctor Method)—EASILY! EFFICIENTLY! ECONOMICALLY! The Barco Rammer is especially useful for compacting fill in restricted areas. ASK FOR A DEMONSTRATION.

When You're Up Against A Tight Schedule—One of the biggest advantages offered by Barco Rammers is ability to handle work in minimum time. On area tamping, one man can average 20 to 30 cubic yards of fill per hour. On trench back fill, using lifts up to 24", the rate for 18" trench is 360 to 600 feet per hour. *When time is at a premium,* BARCO PERFORMANCE PAYS DIVIDENDS—find out about it NOW!

For Soil Compaction Close to Walls, Culverts and Abutments —in Trenches, Ditches

Sold and Serviced by the Nation's Leading Distributors

FOUNDED 1908

BARCO BARCO RAMMER

PRODUCTS BACKED BY EXPERIENCE

BARCO MANUFACTURING CO.
514G Hough St., Barrington, Illinois

Gentlemen:
YES! I want to know about Barco Rammers for Soil Compaction:

Name____________________

Company____________________

Address____________________

☐ Please send me the name and address of your nearest dealer.

☐ Without obligating me, I would be interested in a DEMONSTRATION.

☐ Please send General Catalog No. 621.

☐ Please send free bulletin on "SOIL COMPACTION COST DATA."

. . . *Publications*

Pressure pipe

"The story of Concrete Pressure Pipe." Explains principle of prestressing, how prestressed pipe is made. Installation and tapping procedures. Table of sizes, weights and normal operating heads. Price Brothers Co. **512**

Clay pipe

A line of clay pipe that features a factory-made double-ball, compression joint is described in an 11-page brochure. A number of different companies throughout the nation manufacture the Wedge-Lock Clay Pipe. **513**

Plastic tubing, fittings

Plastic tubing and fittings for use in chemical plants, laboratories, etc. Specifications, prices, chemical resistance table. Cobon Plastics Corp. **514**

Industrial pumps

Performance curves and calculations on a line of end-mounted industrial pumps of regenerative centrifugal type. 36 pages. The Roy E. Roth Co. **515**

Control valve

CM 11 series multiple unit direction control valves for use on hydraulically operated mobile equipment. Valves rated to 2,500 psi working pressure with flow rate at 15 gpm. Cutaway drawings. Eight pages. Vickers Inc. **516**

Ball valves

For a wide range of fluid control applications. List 26 ball valves range in size from 10 in. to 42 in., 150 to 250 psi with choice of operators. Specs. 24-page booklet. Willamette Iron and Steel Co. **517**

Check valves

Installation dimensions and procedures, maximum working pressure chart for a line of check valves, sizes 2 in. through 12 in. Mission Valve and Pump Co. **518**

Valves

Illustrations with brief descriptions and specifications on line of bronze, iron body and cast steel valves. 16 pages. R-P&C Valve Div., American Chain & Cable Co., Inc. **519**

Valve convertor

Conversion kits to "power up" a wide variety of iron or steel gate valves with a 2½ in. or smaller diameter stem. Called Converto-Gear Operator. Crane Co. Industrial Products Group. **520**

For More Information . . .

. . . Select the publications you want and circle the key numbers (shown at the end of each item) on the inquiry card at the end of this section.

Link-Belt's creative answer to a critical sewage problem:

Complete, two-stage bio-filtration in one compact, low-cost unit

BIO-PAC

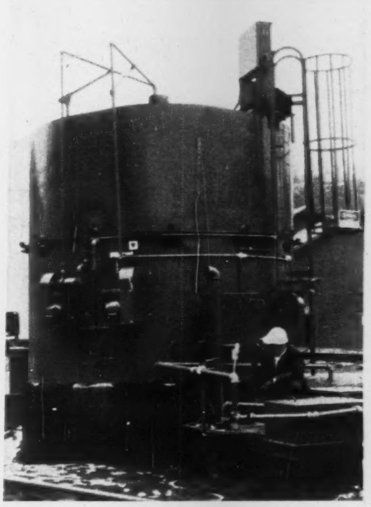
offers "Big City" sewage processing for the needs of 50 to 500 people

Link-Belt's Bio-Pac brings the economies and efficiencies of "big-city" bio-filtration sewage treatment to areas remote from metropolitan sewerage service. Single units are available to serve 50 to 500 people—perfect for housing developments, trailer courts, motels, shopping centers, industrial plants, schools and institutions.

Bio-Pac literally gives you a functional scaling down of large-volume sewage-plant concepts. Yet, the "scaled-down" design is a matter of size only . . . no compromise of quality! Each unit is a highly efficient, two-stage bio-filtration system . . . built to meet the Ten State Standards for sewage works.

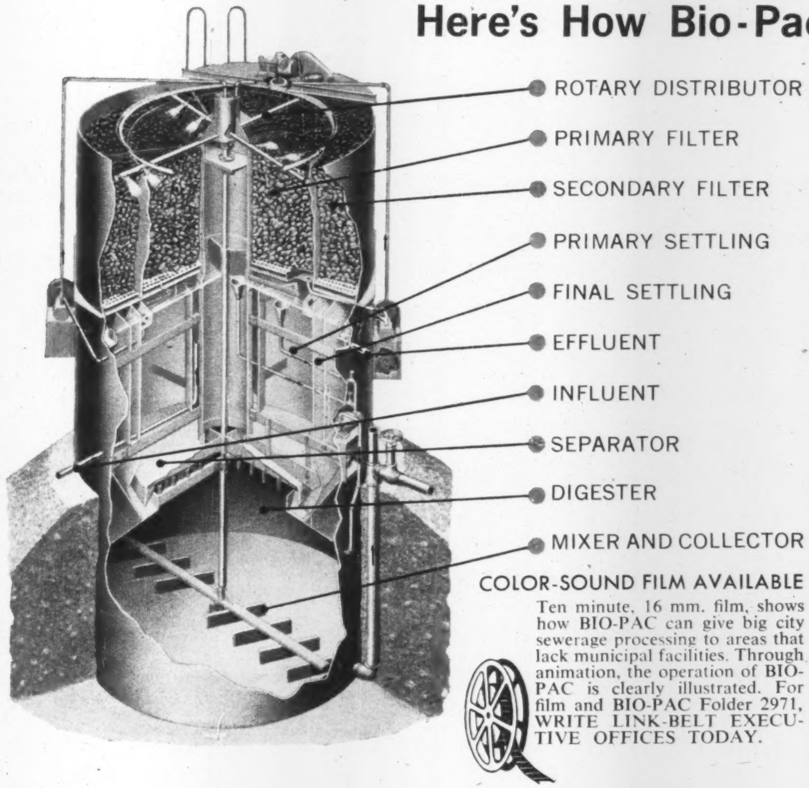
Even under adverse conditions, Bio-Pac produces a consistently stable effluent. It readily absorbs shock loads which frequently upset aeration-type units. And power requirements are much lower than for aerated systems. Important too, Bio-Pac is entirely automatic. Only part-time care is required . . . by personnel who needn't be highly trained.

Because of its exceptional compactness, Bio-Pac can be easily concealed through landscaping and other techniques commonly used in connection with electric service and water storage facilities.



BIO-PAC SEWAGE Treatment Plant for 18,000 G.P.D. flow of sanitary waste. Installed at Houdaille Construction Material Co., Bridgeport Twp., near Bound Brook, New Jersey Plant.

Here's How Bio-Pac Works



Bio-Pac two-stage treatment starts with removal of the settleable solids in a primary settling compartment. Then, sewage is pumped to two bio-filters operating in series, where aerobic bacteria remove 85 to 95% of the suspended solids and B.O.D. (Biochemical Oxygen Demand). The last stage, a final settling compartment, completes the process of producing a stable effluent.

Sludge from both primary and final settling compartments goes into the digester. Disposal of digested sludge can be done on drying beds or by tank truck haul-away about once or twice a year.

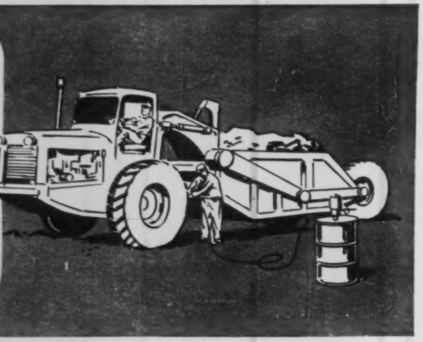
COLOR-SOUND FILM AVAILABLE

Ten minute, 16 mm. film, shows how BIO-PAC can give big city sewerage processing to areas that lack municipal facilities. Through animation, the operation of BIO-PAC is clearly illustrated. For film and BIO-PAC Folder 2971, WRITE LINK-BELT EXECUTIVE OFFICES TODAY.

LINK-BELT

SANITARY ENGINEERING EQUIPMENT

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. Sanitary Engineering Regional Office—Atlanta, Chicago 9, Colmar, Pa., Kansas City 8, Mo., San Francisco 24. District Sales Offices in All Principal Cities. Export Office, New York 7. Representatives Throughout the World. 15,600



Get them back on the job faster with GRACO HYDRA-CLEAN

● Clean equipment not only looks better, but is easier to repair and maintain. When your equipment is in the shop for overhaul or inspection clean it *first* with Graco Hydra-Clean, the air-powered washer that gets all the dirt . . . even in deep crevices. Then watch how much easier and *faster* it is to find and repair equipment deficiencies.

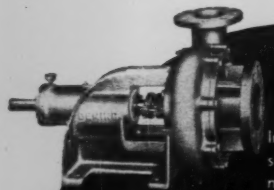
For information on timesaving Graco Hydra-Clean or Lubrication equipment see your nearest Graco distributor or write:

GRACO
ENGINEERS AND MANUFACTURERS

GRAY COMPANY, INC.
648 Graco Square
Minneapolis 13, Minnesota

See Phone Book Yellow Pages "Lubricating Equipment" for Graco Suppliers

CIRCLE 47 ON READER SERVICE CARD


PUMPS THAT "GROW"
Versatile
Centrifugal

Interchangeable on the same power frame, you need merely put larger liquid ends and motors on Deming End Suction Centrifugals to increase your pumping capacity as your production needs grow. Literally thousands of everyday parts combinations. Standard parts —no inventory problems. Write today for full information.

The DEMING Company
604 Broadway • Salem, Ohio

CIRCLE 248 ON READER SERVICE CARD

. . . Publications

Vacuum filters

Dimensions and installation drawings, capacity tables and other engineering data on a line of swimming pool or industrial process water filters. Seven pages. B-I-F Industries. **521**

Moisture-density meter

System with radioactive source measures moisture content and density of soil. 12-page booklet describes instrument in detail. Testlab Corp. **522**

Packaged generators

Complete guide to Amp-Pak packaged generators. Helpful electrical information. Line includes, 120/208, 240, 480 and 600-volt, single and three phase units. Electric Machinery Mfg. Co. **523**

Uninterrupted power supply

Two units to provide continuous standby power when normal power sources fail. Both types available in power ratings from 5 to 200 kw. Consolidated Diesel Electric Corp. **524**

High-voltage cable

Insulated cables with butyl-base high voltage insulation. Data on carrying capacities, dimensions and various designs in 20-page booklet. The Okonite Co. **525**

Lighting fixtures

Combination fluorescent fixtures and air-distribution troffers. Light output curves, air diffusion capacities. Specs. 18 pages. Sylvania Electric Products, Inc. **526**

Lighting fixtures

Endura series: round, square, flush or dropped, baffled or recessed-lens. For incandescent lamps. Dimensions, drawings, and catalog number. Specs. 15 pages. Litecraft Mfg. Co. **527**

Lighting diffuser

Circlgrid lighting diffuser, ½ in. thick, with circular cells. Translucent vinyl panels, perforated or nonperforated. Brightness curves and coefficients of utilization. Four pages. Cirvac Plastics, Division of Wilson Research Corp. **528**

Street light refractors

Design and application data on Holophane Prismatic street lighting refractors under various conditions and with lamps of numerous manufacturers. 26 pages. Holophane Co. **529**

For More Information . . .
. . . Select the publications you want and circle the key numbers (shown at the end of each item) on the inquiry card at the end of this section.

Look into this culvert
if you're looking for culvert that lasts

This 232-foot-long culvert will carry irrigation water under a new four lane highway near Livingston, Montana. It's made from USS AmBridge Sectional Plate: a tough, zinc-coated corrugated steel product that's famous for long life. Many steel culverts like this one have already outlasted the highways they were buried under.

USS AmBridge Sectional Plate is available in a complete range of sizes and is fabricated to meet all federal and state specifications. It's highly corrosion resistant and is pre-punched for fast assembly. Just smooth the grade line, set the sheets into place, bolt them together and then backfill. No need to build forms or sit out costly curing time.

American Bridge has a new booklet about USS AmBridge Sectional Plate. Write for your free copy. American Bridge Division, 525 William Penn Place, Pittsburgh 30, Pa.

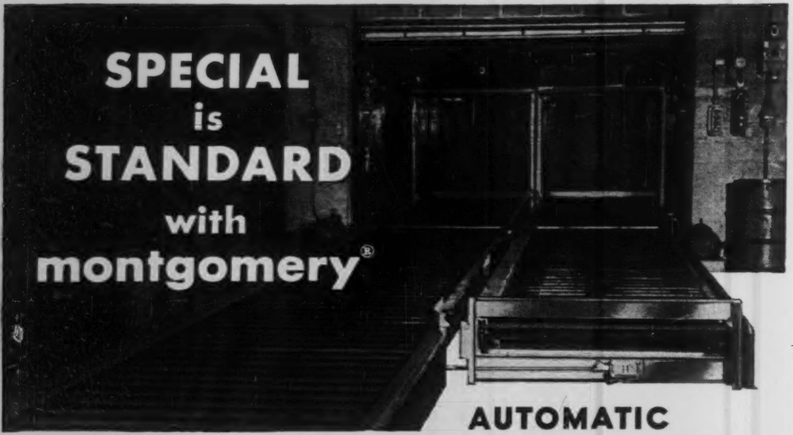
USS and AmBridge are registered trademarks

This mark tells you a product is made of modern, dependable Steel.

General Offices:
525 William Penn Place, Pittsburgh, Pa.

Contracting Offices in:
Ambridge • Atlanta • Baltimore •
Birmingham • Boston • Chicago •
Cincinnati • Cleveland •
Dallas • Denver • Detroit •
Elmira • Gary • Harrisburg, Pa. •
Houston • Los Angeles •
Memphis • Minneapolis • New York •
Orange, Texas • Philadelphia •
Pittsburgh • Portland, Ore. •
Roanoke • St. Louis •
San Francisco • Trenton •
United States Steel Export Company, New York

American Bridge
Division of
United States Steel


SPECIAL is STANDARD with montgomery®

AUTOMATIC MATERIAL FLOW

into and out of specially designed Montgomery Elevators installed in midwest refinery of one of the nation's leading oil companies. Power driven roller conveyors, built in the elevator car floors, turn until car is loaded . . . doors close and car proceeds to floor indicated . . . levels automatically, doors open automatically and conveyor starts again to unload car.

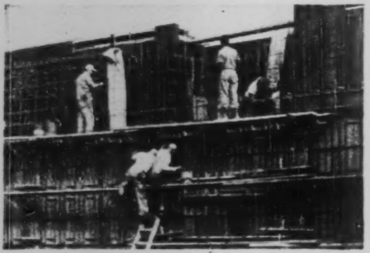
Design and construction of unusual industrial elevator installations such as these palletized material handling units are regular events for Montgomery engineers. Equally unusual requirements have been met to provide elevators for giant testing machines; for cross-over bridges; for the nation's leading parking garages. Unusual, yes, but you can depend on Montgomery for all types of elevators, including attendant and self-operated electric and hydro-electric passenger and freight elevators.

MONTGOMERY Dependable ELEVATORS

montgomery®
ELEVATOR COMPANY Moline, Illinois
Exclusive Manufacturers of Passenger and Freight Elevators for over Sixty-Eight Years
Offices in Principal Cities

MONTGOMERY ESCALATORS • STEPHENS-ADAMSON SPEEDWALKS AND SPEEDRAMPS

CIRCLE 49 ON READER SERVICE CARD


INCREASED PROFITS with EFCO FORMS

- Save time, material, money.
- Steel faces assure lifetime service.
- Easy to handle and assemble.
- Available with return option.
- Free form erection drawings.

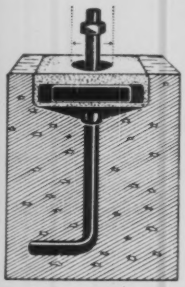
ECONOMY FORMS CORP. EFCO ECONOMY FORMS

MAIL TODAY

ECONOMY FORMS CORP.
Box 128-A, H. P. Station
Des Moines, Iowa

Please send catalog on EFCO Steel Forms, and address of nearest sales office (there are 30 coast to coast).

Name
Firm Name
Address
City State


NOW!

Machine Setting Is Easy!

EASY DOES IT WITH THIS NEW DECO Anchor Bolt Fitting

No time lost in correcting misplaced bolts. Hoisting and lowering machine over bolts isn't necessary. Anchor bolt adjusts to correct error made in setting. Malleable iron housing is stronger than companion bolt. Sizes 3/8 to 1½" bolt diameter. Listed in Sweet's Plt Engrg & Ind. Constr Files. Available from stock.

Write for details to . . .

Decatur Engineering Co.
519 E. William Decatur, Ill.

CIRCLE 50 ON READER SERVICE CARD

. . . Publications

Methods

Bridge construction

Fifteen ways to reduce the cost of short-span steel bridges. Eight pages. American Institute of Steel Construction. 530

Grader use

Use of graders for haul road maintenance and spreading fill explained in 12-page, 2-color booklet. Caterpillar Tractor Co. 531

Stabilized road bases

Step-by-step directions for stabilizing road bases with salt. Tables for salt application per inch of compacted depth, aggregate per mile of road, areas of pavement surfaces. 18 pages. Morton Salt Co. 532

Rock salt

Advantages of rock salt for de-icing pavements. Tables show braking distance, traction effectiveness and material requirements for salt, slag, sand and grit, and melting ability and cost of various chemicals. Eight pages. Morton Salt Co. 533

Road maintenance

Year-round maintenance of unpaved roads explained in 36-page booklet. Includes question and answer section, instructions for crowning, blading and compacting. Calcium Chloride Institute. 534

Calcium chloride

How to handle, store and apply calcium chloride. 42 pages. Calcium Chloride Institute. 535

Sub-soil surveying

Manual explains Barnes Layer Method of sub-soil surveying for locating subsurface gravel beds, rock deposits and unstable soils. Associated Research, Inc. 536

Welding

ASTM specs, operating characteristics, mechanical properties and applications of mild-steel and low-hydrogen electrodes for welding. Proper electrodes to use with various mild and low alloy steels. 20 pages. McKay Co. 537

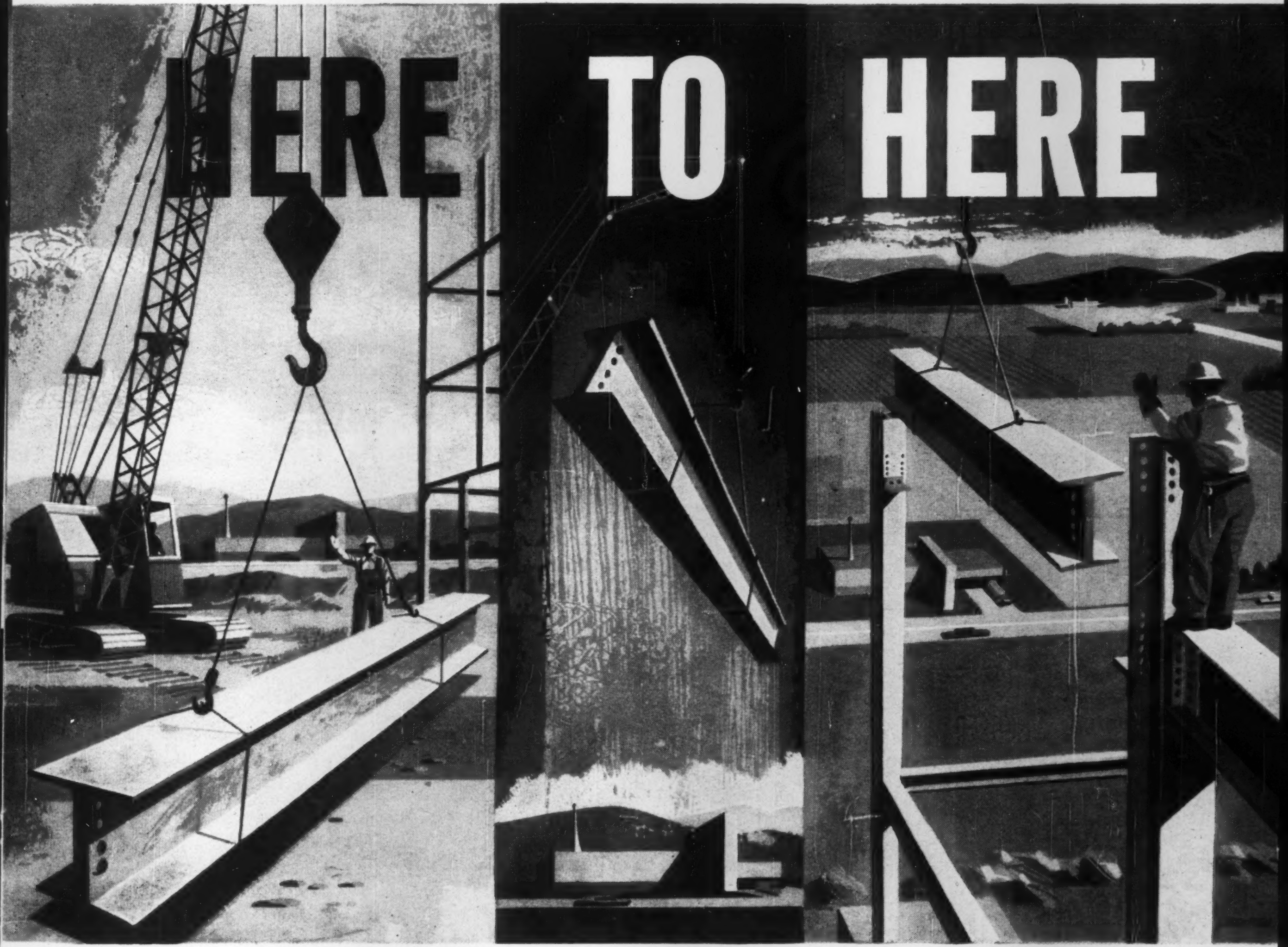
Stress-relieving weldments

Why, when and how to stress-relieve welded joints for pipes and vessels. Coil construction, trouble-shooting guide. 32 pages. Hobart Brothers Co. 538

For More Information . . .

. . . Select the publications you want and circle the key numbers (shown at the end of each item) on the inquiry card at the end of this section.

MARION'S NEW Adjustable-Speed TRANSMISSION GETS YOU FROM



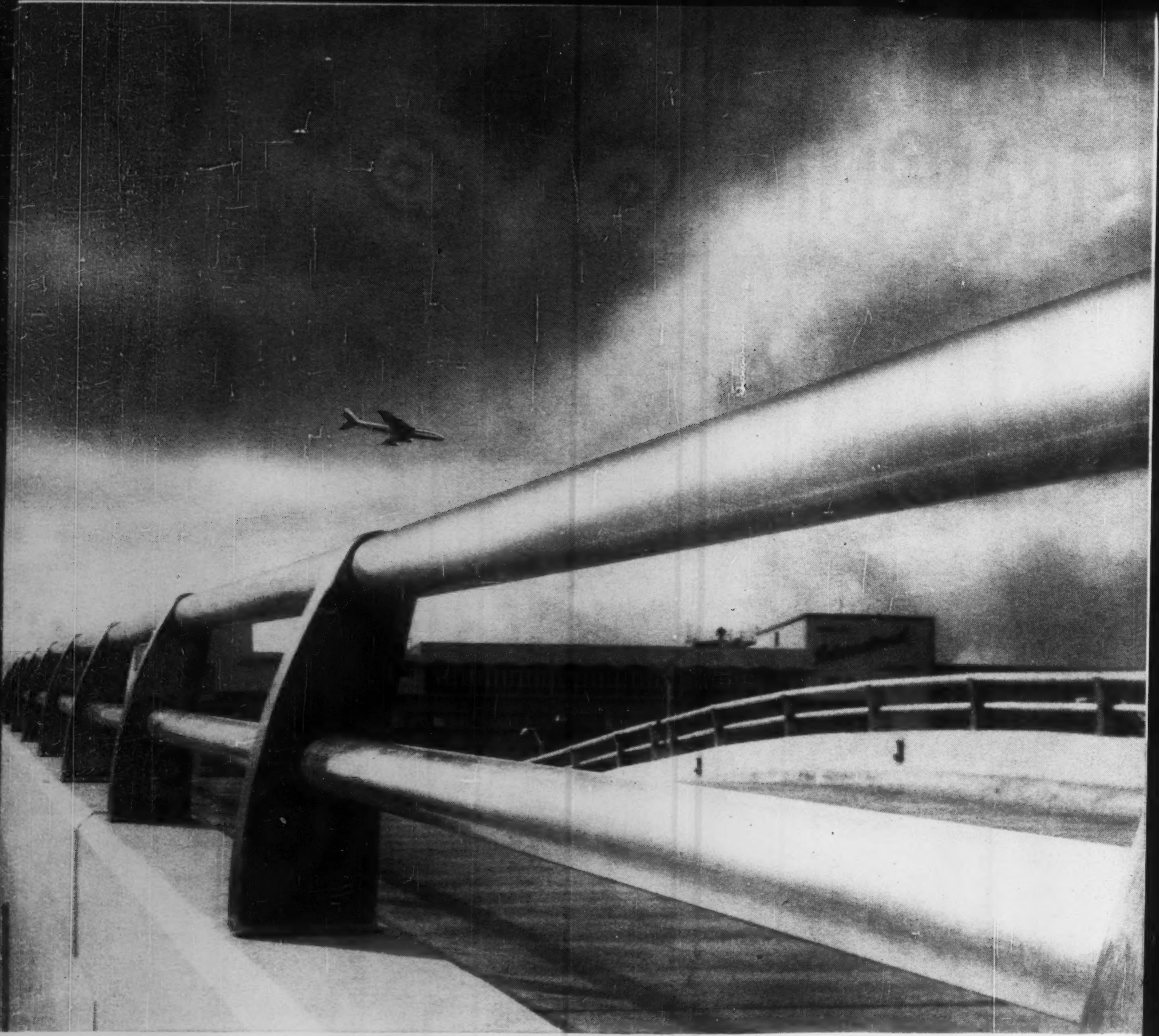
FASTER, SMOOTHER...and SAFER!

Marion's done it again! This time with an instant-shift transmission called GEARMATIC that lets your operator shift ANY TIME during the lift WITHOUT STOPPING OR EVEN SLOWING the hoist machinery. There's a low-speed, deep-power ratio for easing the load off the ground and for accurate final spotting . . . a high speed ratio for rapid hoisting . . . and an intermediate speed for average work. Your operator simply selects the speeds he wants to use—without touching a clutch or brake. We can put you lifts ahead of your competition with a GEARMATIC-equipped Marion. Let us tell you more!

MARION POWER SHOVEL COMPANY • MARION, OHIO
A Division of Universal Marion Corporation

CIRCLE 251 ON READER SERVICE CARD

MARION



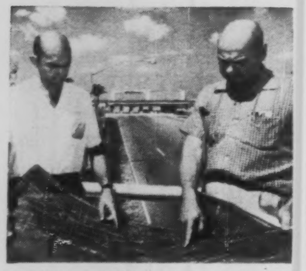
AT MIAMI INTERNATIONAL AIRPORT...

Alcoa Aluminum sparkles

"Alcoa's bridge rail is easier to install . . . better looking in the beginning and after it's been up there five years!"—Smith

"Everything at the Miami International Airport is new, beautiful, sparkling. We know it's going to stay that way, because it's aluminum!"—Peterson

"Aluminum belongs in Florida—if for no other reason than it won't rust!"—Smith



G. L. Smith and C. H. Peterson, consulting engineers to the Dade County Port Authority.

. . . Sound pretty favorable toward this contemporary metal? These statements (and many others, equally complimentary) were made by men who know . . . men who were responsible for specifying and are now maintaining the network of roads and ramps at the Miami International Airport.

Faced with sea air . . . corrosive salt air that is "murder on anything except aluminum" . . . designers and authority officials specified aluminum. They demanded a metal that would be compatible with the style and spirit of the new air terminal, strong enough to withstand hurricane or fast auto . . . and

CIRCLE 252 ON READER SERVICE CARD

"welcome" to millions!

low in maintenance cost over the years.

The consulting engineering firm of Howard, Needles, Tammen and Bergendoff had to consider both erection costs and maintenance costs. The Dade County Port Authority has to report annually to its bondholders . . . they are also concerned with maintenance costs.

The Alcoa® Bridge Rail shown at the Miami International Airport is only one of many aluminum installations to be seen on both sides of the salty Florida peninsula. Alcoa Aluminum is the modern and progressive metal for all highway products. And it spells out a "sparkling welcome to millions of tourists—from the city of Miami and from the Sunshine State!"

For more information about Alcoa Bridge Rail and other Alcoa Aluminum highway products, write: Aluminum Company of America, 895-F Alcoa Building, Pittsburgh 19, Pa.

ALCOA ALUMINUM

HIGHWAY PRODUCTS

Welding pressure pipe

Practical information on techniques and costs related to cross-country transmission and pressure piping systems. Lincoln Electric Co. **539**

Tapping manual

Step-by-step procedure for tapping pre-stressed concrete steel cylinder pipe under pressure. Price Brothers Co. **540**

Highway signing

Criteria for proper highway sign lighting. Sketches and photographs. Explanation of how to determine required illumination levels. 20 pages. General Electric Co. **541**

Backing for crushers

Directions for using Nordbak for backing liners of cone crushers, giratory crushers and grinding mills. Two-page fold-out. Nordberg Manufacturing Co. **542**

Miscellaneous

Water services

Company lists complete line of services to users of ground water. Layne & Bowler, Inc. **543**

Erosion control

Jute mesh for controling erosion and saving soil. Four pages. Ludlow Textile Products. **544**

Thermal snow melters

Specifications, capacities, and construction details for Thermal snow melters of 25 to 75 tph capacities. Information on figuring machine size needs. Thermal Research & Engineering Corp. **545**

Safety net

Construction details and suggested uses for Manila rope safety panel nets. Pedley-Knowles & Co. **546**

Wire rope

Installation and maintenance of wire rope for ski-lifts and uphill passenger trams. Includes recommendations for rope types, splicing methods and counterweighting. 12 pages. Bethlehem Steel. **547**

Wire rope

Job applications for Yellow Strand wire rope. Eight pages. Broderick & Bascom Rope Co. **548**

Reflective markers

Uses, application methods, characteristics of Prismo Plastix "SD" permanent type reflective markers for roadway signing, and striping and crosswalk marking. Marking designs, code requirements and available legends. 12 pages. Prismo Safety Corp. **549**

Ladder steps

Wrought iron steps for sewage plant and manhole ladders. Typical designs, advantages of galvanizing, several installations. Nine pages. Byers Engineering Service Dept. **550**

Plastics

Catalog of plastic items—dust covers, protective garments, laboratory supplies. Book suggests many safety applications and time-saving ideas. Testing Machines Inc. **551**

Pipe dimension chart

Outside diameters and wall thickness for all sizes of seamless and welded pipe from ½ in. through 42 in. based on ASA B36.10-1959. Shows iron pipe sizes and schedule numbers and their relationship. Midwest Piping Div., Crane Co. **552**

Copying machines

Two booklets on machines that rapidly copy translucent or semitransparent documents. Floor and desk models. 17 pages. Desk model 110. Four pages. Charles Bruning Co. **553**

Drafting aids

Modular drafting tables and files. Specs, planning guide. 32 pages. Hamilton Mfg. Co. **554**

Jennite J-16
PROTECTS ASPHALT

Connecticut State Capitol Building, Hartford

Jennite J-16® protects pavement at Connecticut capitol

Jennite J-16 is the original . . . the world's most widely used coating for blacktop pavements. It protects leading airfields, playgrounds, parkways and parking lots.

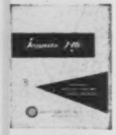
Classic beauty of Connecticut's famous capitol is greatly enhanced by the attractive satin black of its Jennited drives.

Jennite J-16, applied to either new or old asphalt, protects your pavement investment . . . doubles service life. It seals out frost and water . . . retards drying action of the sun, stops oxidation, eliminates destructive damage of gasoline and oil . . . keeps the surface free of dangerous, loose particles.

In addition, Jennite is economical . . . tough, easy to clean, long lasting.

Find us fast in the 'Yellow Pages'

For complete information on how to protect your asphalt investment, write for Bulletin M-2992. Also, see our catalog in Sweets.



MAINTENANCE® INC. WOOSTER OHIO

Distributors and stocks in principal cities

A-3927A

Information Service Center

How You Can Get More Information

Here's the easy way to get copies of manufacturers' publications, editorial reprints and more information about products and services advertised in ENR.

Manufacturers' publications items are selected by ENR editors for their reader interest. Often these items offer detailed descriptions of products already introduced to readers in ENR's New Products Department. The information service card on this page thus gives you a second opportunity to get information on products that are now available.

ENR editorial reprints, available free, include technical and business articles, special reports, annual surveys, check lists of the right way to do things and stories on successful products, methods and men.

Editorial reprints are also available via the inquiry card. Single copies are free; for quantity rates, write Information Service Center, ENGINEERING NEWS-RECORD, Post Office Box 7649, Philadelphia 1, Pennsylvania.

How It Works . . .

1. Circle number on card corresponding to key number of the publication, ad or reprint you're interested in.
2. Fill out the spaces on the bottom for name, position, address, etc.
3. Drop the card in the mail. We'll do the rest. The reprints you request will come from us directly. The publications you seek from manufacturers will come individually from them.

Fast Service . . .

The information service card is designed to get you what you want to know quickly and easily. There are two of them: One for you; one for a friend or business associate who may read your copy.

FIRST CLASS
PERMIT NO. 23037
PHILADELPHIA, PA.

BUSINESS REPLY MAIL
No Postage Necessary if Mailed in the United States

POSTAGE WILL BE PAID BY

ENGINEERING NEWS-RECORD

P.O. Box 7649
Philadelphia 1, Pa.

Information Service Center

Circle Key Number and Print Name on Coupon *(Good until Aug. 15, 1961*

ADVERTISED PRODUCTS:							INSIDE FRONT COVER						INSIDE BACK COVER					BACK COVER	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200
201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220
221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240
241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260
261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280
281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300
301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320
321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340
MANUFACTURERS' PUBLICATIONS:										401	402	403	404	405	406	407	408	409	410
411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430
431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450
451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470
471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490
491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510
511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530
531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550
551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570
EDITORIAL REPRINTS:					571	572	573	574	575	576	577	578	579	580	581	582	583	584	585

NAME ____________________ POSITION ____________________

COMPANY ____________________

BUSINESS ADDRESS ____________________

CITY ____________________ ZONE ____________ STATE ____________________

Did You Miss Any of These Top Articles?

You can order free reprints of the ENR articles below. It's a good chance to catch up on what you missed, get a file copy, or pass one along to an associate. Just circle the numbers on the inquiry card that correspond to the articles you want. Single copies are free as long as they last. Write for quantity prices.

571. Aluminum Bridge—The first application of aircraft design techniques to highway bridge construction.

572. Instant Concrete in Bags—"Cake mix" concrete is claimed to slash the price of batching by up to 75%.

573. **Good Looks Count in This Bridge Design**—This bridge is a standout in the nation's capital, where all public structures must win approval from a fine arts commission.

574. **Tall Precast Panels Wall Department Store** — Patterned concrete panels make a handsome facade for any store.

575. **Big Augers Go Deep**—60-story buildings will rest on caissons sunk deep into the ground by these giant augers.

576. **Space Age Symbol: Air Academy's Chapel**—Tubular steel tetrahedrons—100 of them—gang together to form a 17-spired roof for the Air Force's multifaith chapel.

577. **To Cover Assembly Bowl: A 400-ft Prestressed Saucer**—One of the world's largest concrete roofs has no interior supports.

578. **A New Tool for Job Management**—A report on the Critical Path Method for planning, estimating, scheduling and control of engineering or construction projects.

579. **How to Figure Steel Weight in Bridges**—A chart gives minimum weight in highway bridges, an aid to estimating dead loads and costs

580. **Seven Construction Tricks That Can Save You Money**—Ingenious home-made equipment that any contractor can copy for his own use.

510. **New Plants for New Products**—A 27-page report of future trends in industrial design and construction.

Circle Key Number and Print Name on Coupon *(Good until Aug. 15, 1961*

ADVERTISED PRODUCTS:							INSIDE FRONT COVER						INSIDE BACK COVER					BACK COVER	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200
201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220
221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240
241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260
261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280
281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300
301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320
321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340
MANUFACTURERS' PUBLICATIONS:										401	402	403	404	405	406	407	408	409	410
411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430
431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450
451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470
471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490
491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510
511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530
531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550
551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570
EDITORIAL REPRINTS:					571	572	573	574	575	576	577	578	579	580	581	582	583	584	585

NAME __________ POSITION __________

COMPANY __________

BUSINESS ADDRESS __________

CITY __________ ZONE __________ STATE __________

FIRST CLASS
PERMIT NO. 23037
PHILADELPHIA, PA.

BUSINESS REPLY MAIL
No Postage Necessary if Mailed in the United States

POSTAGE WILL BE PAID BY

ENGINEERING NEWS-RECORD

P.O. Box 7649
Philadelphia 1, Pa.
Information Service Center

Construction Reports

Bids Asked—Low Bidders—Contracts Awarded—

NEW ENGLAND

HEAVY CONSTRUCTION—BA

† **Conn., Groton**—BA 6/27—Officer in Charge of Constr., U. S. Naval Submarine Base, Box 26, New London, repairs to WATER LINES, NBy-26821. $25,000. CD 9/25/59.

† **Conn., New London**—BA 6/27—U. S. Navy Underwater Sound Laboratory, Fort Trumbull, New London, repair and extension of concrete RAMP, vicinity of Berth No. 5, Proj. NBy-26844. $10,000.

† **Mass., Boston**—BA 6/27—Dist. P. Wks. Office, First Naval Dist., Navy Bldg., 495 Summer St., Boston 10, FENCING, Enlisted Men's Club, U. S. Naval Station, Contr. NBy 39823, Spec. No. 39823/61. Under $10.

† **Mass., Nantucket**—BA 6/27—U.S.A. Supply Section, First Coast Guard Dist., 447 Commercial St., Boston, COAST GUARD STATION at Siaconset, Inv. SO 672-61. Over $5,000.

† **Mass., Quincy**—BA 6/27—Dist. P. Wks. Office, 1ND, 495 Summer St., Boston 10, rehabilitation HOT WATER SUPPLY SYS., Squantum Gardens, NBy 37453, Spec. No. 37453/61. Under $25,000. Plans deposit $25.

† **R. I., Newport**—BA 6/27—First Naval Dist., 495 Summer St., Boston, Mass., REHAB. GALLEY BLDG. NO. 1808, Naval Station Coddington Point area, NBy 37518, Spec. No. 37518. $25,000-$100,000. Michael Traficante, 175 Taunton Ave., East Providence, archt. CD 8/27/56.

† **R. I., Quonset Point**—BA 6/27—Officer in Charge of Constr., Contract Division Office, Bldg. No. 438, U. S. Naval Air Station, provide MODIFICATIONS TO THE 480 VOLT SECONDARY DISTRIBUTION SYSTEM serving Avionics Shops in seaplane hangar No. 3, Bldg. No. 406, at the U. S. Naval Air Station, NBy 37591, Spec. No. 37591/61. Under $25,000.

† **R. I., Quonset Point**—BA 6/27—Contract Division Office, Bldg. No. 438, U. S. Naval Air Station, CONSTR. GENERATOR ENCLOSURE and INSTALL GOVERNMENT FURNISHED EMERGENCY ENGINE GENERATOR, U. S. Naval Air Station, NBy-37592, Spec. No. 37592/61. Under $25,000.

† **Me., Jonesport**—BA 6/28—Dist. P. Wks. Office, 1ND, 495 Summer St., Boston 10, Mass., GATESHOUSES and INCINERATOR, U. S. Naval Radio Station (T), Cutler, NBy 37462, Spec. No. 37462/61. $25,000-$100,000. Plans deposit $25. CD 9/28/59.

† **N. H., Portsmouth**—BA 6/28—Dist. Pub. Works Office, 1ND, 495 Summer St., Boston 10, Mass., REPAIRS TO PAVEMENT, DRAINAGE, TRACKING, fitting-out Pier No. 2, Portsmouth Naval Shipyard, NBy 39825, Spec. No. 39825/61. $25,000-$100,000. CD 7/27/60.

† **Mass., Topsfield**—BA On Or About 7/13—U. S. Eng., 424 Trapelo Rd., Waltham, Mass. SEWAGE TREATMENT PLANT, Capehart Housing off Newburyport Turnpike US Hy. No. 1 between North St. and Salem Rd., ENG-19-016-61-39. Approx. $35,000. Plans deposit $2.50. CD 2/20/61, under LB.

BUILDINGS—BA

† **Conn., West Haven**—BA 6/30—U. S. Veterans Admin., Campbell Ave., U. S. Veterans Admin. HOSPITAL ADDN., Campbell Ave. CD 2/3/58.

Mass., Westboro—BA 6/30—Home Contractors, Inc., 37 Temple Pl., Boston, Mass. (selected list bidders), furnish and erect 5 prefabricated INDUSTRIAL PLANTS incl. fdn. and site work. Extended date. $200,000. Professor Thomas E. Phalen Jr., Northeastern University, Boston, Mass., engr. CD 5/19/61.

Mass., Revere—BA 7/7—City Housing Auth., 70 Coolidge St., Proj. 667-2 State Aided Proj. HOUSING for the ELDERLY. $700,000. Harold M. Turiello, 1025 Revere Beach Parkway, Revere, Mass., archt. CD 12/5/60.

Conn., New Britain—BA 7/6—Mary Immaculate Academy, 314 Osgood Ave., SCHOOL, 2 story, science center, chemistry, physics laboratory, library, chapel, addn. to mother house, Osgood and Corbin Aves. $400,000. Russell, Gibson & von Dohlen, 10 Ellsworth Rd., West Hartford, archts. Onderdonk & Lathrop, 2512 Main St., Glastonbury, engrs. Fred S. Dubin Assocs., 635 Farmington Ave., Hartford, struct. engrs. CD 6/5/61.

HEAVY CONSTRUCTION—LB & CA

MAINE—State Hy. Comn., Augusta, ROAD,

Frank Rossi & Sons, Inc., Gardiner, Me., CA **$92,505** (4 bidders) b. conc. surf. 4.095 mi. Vassalboro-China. FASP No. S-0210(11), Contr. 3 and S-0215(8), Contr. 2, Kennebec Co. BA 6/7. CD 5/19/61.

MAINE—State Hy. Comn., Augusta, bids opened 6/7 ROAD,

Lee Brothers, Albion, Me., LB **$114,832**, (2 bidders), bit. gravel road 1.012 mi. Brunswick., Proj. No. N-AD-11(1), Cumberland Co. CD 5/22/61.

† **Bernstein & Jacobson, Inc.**, 115 Commercial St., Portland, Me., LB **$76,472** Lot No. 1, LB **$64,306**, Lot No. 2, LB **$52,140** Lot No. 3, (8 bidders) rehabilitation BREAKWATER at Matinious Island. CIVENG 19-016-61-56, MAINE. U. S. Eng., 424 Trapelo Rd., Waltham 54, Mass. BA 6/7. CD 5/26/61.

Pacella Bros. Corp., 145 Washington St., Dedham, Mass., LB **$305,385**, est. $300,000 (20 bidders) Contr. No. 2, SEWAGE PUMP STATION, FORCE MAIN SEWERS, SANFORD, ME. Sanford Sewerage Dist., 259 Main St., Sanford, Me. BA 6/6. CD 5/17/61;

H. E. Sargent, Inc., Stillwater, Me., LB $142,045 est. **$150,000** (18 bidders) Contr. No. 3, SEWAGE STABILIZATION POND, (Sanford, Me.).

VERMONT—State Hy. Dpt., State House, Montpelier, Bids opened 6/9, ROADS,

The Lane Constr. Corp., P. O. Drawer 911, Meriden, Conn., LB **$494,867**, est. $525,000 (6 bidders), Int. Rte. 99, Proj. 1-89-3(14), Contract 1, Williston-South Burlington. CD 5/9/61.

VERMONT—State Hy. Dpt., State House, Montpelier, ROADS,

W. H. Hinman Inc., 58 Main St., Westbrook, Me., CA **$931,776**, est. $950,000, highway and three bridges, Int. Rte. 89, Contr. 3, 1-89-3(14), Williston-South Burlington. BA 6/2/61. CD 6/7/61 under LB.

New England Dredging & Dock Co., 60 S. Water St., New Haven, Conn., LB **$114,500**, est. $112,800 (6 bidders), hydraulic DREDGING Allen's and Witchmere Harbors, Harwich, MASSACHUSETTS. Commonwealth Mass., Dpt. P. Wks., 100 Nashua St., Boston, Mass. BA 6/6. CD 5/26/61.

MASSACHUSETTS—Commonwealth Mass., Dpt. P. Wks., 100 Nashua St., Boston, ROAD,

Old Colony Constr. Co. of Quincy, 26 Vernon St., Quincy, Mass., LB **$105,771**, est. $120,506 (10 bidders), Chapter 90, hy. work, West and River Sts. and Fairmont Ave., Hyde Park.

Frank Frederick Constr. Co. Inc., 356 Coney St., East Walpole, Mass., LB **$62,585**, est. $60,000 (12 bidders) furnish and lay 4,200 ft. c.i. WATER PIPE, MARBLEHEAD, MASS. Town, Bd. Water Comrs., Marblehead, Mass. BA 6/8. CD 5/18/61.

† **James Farina Corp.**, 120 Adams St., Newton, Mass., LB **$167,200**, imprv. HERCULES FACILITIES, Nike Battery, HA-48, generator bldg., hibar bldg., tracking radar ground, Mount Hipar Tower with extension site, Cromwell, CONNECTICUT, U.S. Eng., 424 Trapelo Rd, Waltham, Mass. BA 5/23/61. CD 4/26/61.

CONNECTICUT—State Hy. Comr., 170 Douglas St., Hartford, Bids opened 6/12, ROADS,

Angelo Tomasso, Inc., Warren St., New Britain, Conn., LB **$155,303** (5 bidders), Proj. 83-93, 18,300 lin. ft. resurfacing Wilbur Cross Parkway with 2 course bit. conc. pavement, Milford and Orange. CD 5/26/61.

R .D .Wood Co., 1072 Pubilc Ledger Bldg., Philadelphia, Pa., LB **$78,635**, (3 bidders) Contr. 488, 19,000 ft. 40 in. c.i. WATER PIPE, HARTFORD, CONN. Metropolitan Dist. Bd. Contract & Supply, 115 Broad St., Hartford, Conn., BA 6/8/61. CD 5/29/61.

South Windsor Constr. Co., Fishtown Road, Mystic, Conn. CA **$95,000**. MARINA, mooring for 400 small craft, Mystic River, MYSTIC, CONN. Samuel Sisisky, Fishtown Road, Mystic, Conn. CA 6/9/61. CD 5/2/58 under Eugene & Fred Garbarino, as owner.

Torcon Land Development Co., 144 Fairlawn Drive, Torrington, Conn., CA **$90,000**. 9 hole GOLF COURSE, Toffingford West St., TORRINGTON, CONN. East Lawn Country Club, Torringford West St., Torrington, Conn. CA 6/10/61.

BUILDINGS—LB & CA

Saul Copperman, 209 Washington St., Boston, Mass., Separate Contracts **$450,000**, DEPARTMENT STORE, Main St. and Town Hall Pl., BRUNSWICK, ME. Arthur Winebaum, 316 Stuart St., Boston, Mass., archt. Samuel Lesburg, 262 Washington St., Boston, Mass., mech. engr. J. J. Newberry Co., 4 Federal St., Woburn, Mass., lessee. CD 5/18/61.

▲ **Sheridan Corp.**, State Rd., Benton Station, Me., LB **$1,176,000**, 98,000 sq. ft. INDUSTRIAL PLANT, SACO, ME. Saco Development Corp., c/o Mayor, City Hall, Saco, Me.

Davis Constr. Co., 14 Woodcrest Dr., South Burlington, Vt., LB **$163,885**, est. $175,000, (8 bidders), PLANT ADDNS., ALTERATIONS, Industrial Park, BURLINGTON, VT. Cynosure Inc., 187 College St., Burlington, Vt. General Electric Co., Burlington, Vt., lessee. BA 6/8/61. CD 6/7/61.

▲ **White Constr. Co.**, 135 Cambridge St., Burlington, Mass., LB **$1,208,000** est. $1,596,577 (8 bidders), Proj. U-59-2 Contr. 1, NATURAL RESOURCES BLDG., University of Massachusetts, AMHERST, MASS., Commonwealth Mass., Dpt. Educ., Div. Bldg. Constr., 38 Chauncy St., Boston, Mass. BA 6/9. CD 5/17/61.

▲ **M. S. Kelliher Co.**, 10 Tremont St., Boston, Mass., CA **$3,877,000** est. $4,000,000, Proj. HHFA Mass., 19 CH-44, STUDENT UNION, BOSTON, MASS. Boston University, 688 Boylston St., Boston, Mass. Sert, Jackson & Gourley, 15 Eliot St., Cambridge, Mass., assoc. archts. BA 5/23. CD 5/26/61, under LB.

Sawyer Constr. Co., Blanchard Rd., Burlington, Mass., CA **$897,000** ELEMENTARY SCHOOL, Hood School Site, Oakwood Ave., LYNN, MASS. City, City Hall, Lynn, Mass. BA 5/1. CD 5/8/61, under LB.

M. Spinelli & Sons Co. Inc., 25 Moulton St., Cambridge, Mass., LB **$929,000**, est. $950,000, (12 bidders), HOSPITAL alterations, WORCESTER, MASS. Fairlawn Hospital, 189 Main St., Worcester, Mass. BA 6/8. CD 6/2/61.

† **Poorvu Constr. Co. Inc.**, Box 237 Wellesley Hills, Mass., LB **$695,400** est. $745,035 (14 bidders) Sched. 1, REACTOR RESEARCH LABORATORY Bldg. 292 and surface treating facility, Bldg. 44, Watertown Arsenal. ENG 19-016-61-73, WATERTOWN, MASS. Eng., 424 Trapelo Rd., Waltham, Mass. BA 6/1 CD 5/8/61;

Chaney & James Constr. Co. Inc., P.O. Box 1363, Dallas, Tex., LB **$1,153,470**, est. $1,019,250 (14 bidders), Sched. 2, REACTOR RESEARCH LABORATORY Watertown Arsenal (Watertown, Mass.).

▲ **Marcello Mezzullo, Inc.**, 132 Pearl St., Port Chester, N. Y., CA total est. **$1,200,000**, general contract 1 story, 100,000 sq. ft., masonry, steel MFG. PLANT, Morgan's Landing, CLINTON CONN. Universal Wire Co., Country Lane, East Greenwich, R. I. BA 5/12/61. CA 6/12/61. CD 5/11/61.

▲ **Samuel Pescetillo**, Rte. 85, Hebron, Conn., Owner Builds, **$1,490,000**. 100 HOUSES, Abbey Estates, Rte. 85, HEBRON, CONN.

R. H. Smith, Inc., 43 Greer Ave., Milford, Conn., CA **$110,000**, FACTORY ADDN., 925 Bridgeport Ave., MILFORD, CONN., Simplex Tool & Die, 925 Bridgeport Ave., Milford, Conn. CA 6/8/61.

C. H. Nickerson & Co. 252 Hayden Hill Road, Burrville, Torrington, Conn., LB **$400,000**, BANK, Litchfield St., TORRINGTON, CONN. First Federal Savings & Loan Assoc., 9 Mason St., Torrington, Conn. David C. Barker, 1232 Farmington Ave., West Hartford, Conn. archt. Fred S. Dubin Assocs., 635 Farmington Ave., Hartford, Conn engrs. Onderdonk & Lathrop, 2512 Main St., Glastonbury, Conn. struct. engrs.

▲ **P. Francini Co. Inc.**, Water St., Derby, Conn., LB **$1,239,000**, (7 bidders) East Side JUNIOR HIGH SCHOOL, Pond Hill Road, WALLINGFORD, CONN. Town, 1958 Bldg. Comn., N. Main St. Wallingford, Conn. BA 6/8/61. CD 5/12/61.

C. F. Wooding Co., 43 Wallace Ave., Wallingford, Conn. CA **$600,000**, CLUBHOUSE, 18 hole golf course and swimming pool, The Farm, Cheshire Road, WALLINGFORD CONN. The Farms, 135 Colony St., Meriden, Conn. CD 3/10/60.

Harold Jarvis, French Road, Bolton, Conn., CA **$400,000**, 265 x 165 ft. red brick colored tile front DEPARTMENT STORE, Silas Deane Hy., WETHERSFIELD, CONN. Harry Gampel, Et. Al., 1210 Silas Deane Hy., Wethersfield, Conn. Irving W. Rutherford, 186 Sigourney St., Hartford, Conn. archt. CA 6/8/61. CD 12/13/56 under Thomas P. Tracey as owner.

Marlowe Bros., 1330 Whalley Ave., New Haven, Conn., Owner Builds, **$900,000**, 90 HOUSES, Round Hill, Amity Road, WOODBRIDGE, CONN.

Donald D. Snyder & Son, Inc., 49 Chelsea St., Gardner, Mass., LB **$500,000** (6 bidders), SCIENCE CENTER, NEW LONDON, N. H. Colby Jr. College, Treas. Office, New London, N. H. BA 6/3/61. CD 5/24/61.

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $53,000; other public works $88,000; Industrial buildings $110,000; other buildings $400,000. Also Foreign projects of $1,000,000 and more in size of Interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED
New England
Middle Atlantic
South
Middle West
West of Mississippi
Far West

PROPOSED WORK
Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Public Buildings
Mass Housing
Commercial Buildings
Industrial Buildings
Unclassified

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.

BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.

SOON LETS CONTRACT: SLC

LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.

CD dates shown are of Construction Daily Issue in which last previous report was published.

OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

†	Federal Government
▲	Project of $1,000,000 or over.
ENR	Engineering News-Record
CD	Construction Daily

For additional reports see Construction Daily.

HORSE SENSE

FROM IMAGINATION

Your Grating Ideas Can Be Put to Practical Use

In planning your construction job or architectural design, you may be thinking of a novel use for open metal grating. Before you dismiss your idea as unworkable, check it with the Irving company. Irving engineers have an unusual knack for making "horse sense" from imaginative ideas about grating. This know-how is yours free. It can help you put seemingly impractical ideas to practical, economical engineering use.

No matter what feature of grating your idea stresses—drainage, strength, safety, light weight, appearance—you'll find the Irving experience helpful. Write or phone today. Let Irving help you put across your new grating ideas.

Catalog on request

IRVICO

IRVING SUBWAY GRATING CO., Inc.

The ***ORIGINATORS*** ***OF THE GRATING INDUSTRY***
EST. 1902

Offices and Plants at:
5063 27th St., LONG ISLAND CITY 1, N. Y.
1863 10th St., OAKLAND 20, CALIFORNIA

CIRCLE 258 ON READER SERVICE CARD

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

† **Md., Annapolis**—BA 6/26—Area P. Wks. Office, Chesapeake, U. S. Naval Weapons Plant, Wash., D. C., repairs to SEAWALL, U. S. Naval Engineering Experiment Station. NBy 39435. $100,000-$250,000. CD 9/17/57 under Public Buildings.

Md., Hyattsville—BA 6/26—Washington Suburban Sanitary Comn., Hamilton St., Contr. 2217-S, SEWER, Blandensburg Force Main from jct. Chamber to Pumping Station, Blandensburg, Prince Georges Co. CD 11/8/60.

† **Md., Indian Head**—BA 6/26—Area P. Wks. Office, Chesapeake, U. S. Naval Weapons Plant, Wash., D. C., RESTORATION OF MAGAZINES, Naval Propellant Plant. NBy 36150. $250,000-$500,000.

† **Md., Indian Head**—BA 6/26—Area P. Wks. Office, Chesapeake, U. S. Naval Weapons Plant, Wash., D. C., TEMPERATURE and HUMIDITY CONTROL, Bldgs. 715, 720 and 724, Naval Propellant Plant. NBy 39439. $100,000-$250,000.

† N. J., **Bayonne**—BA 6/27—Construction Division Office Bldg. 45/2, U. S. Naval Supply Center, INSTALLATION HIGH PRESSURE STEAM LINE under "B" Street, U. S. Naval Supply Center, NBy-32125, Spec. No. 32125/61. Under $25,000. Small Business set-aside.

▲ **NEW JERSEY**—BA 6/28—State Hy. Dpt., 1035 Parkway Ave., Trenton, ROAD,
Bergen Co.—sand drains and incidental work 0.897 mi. Rte. 95, Section 1K, from vicinity Rte. U. S. 46 to Rte. 80 and Rte. 95 Interchange, Twps. Ridgefield Park and Teaneck, Proj. N. J.-I-95-6(4)62. Plans deposit $15. Bids May 11 rejected. CD 5/16/61 under LB.

▲ **NEW JERSEY**—BA 6/29—State Hy. Dpt., 1035 Parkway Ave., Trenton, ROAD,
Bergen Co.—grading, paving 0.738 mi. and bridges, Rte. 80, Section 5N, from 1000 ft. south Hackensack and Lodi Railroad to vicinity Green St., boroughs Lodi and Teterboro, City of Hackensack and Twp. of Hackensack, Proj. N. J. I-80-5(16)64. Bids May 25 rejected. CD 5/29/61 under LB.

† N. Y., **Brooklyn**—BA 6/28—OICC/ROICC Office, New York Naval Shipyard, Bldg. No. 77, 13th Floor, Brooklyn, replacement of fresh and salt WATER LINES, Market St., New York Naval Shipyard. Contr. NBy 32084 Spec. No. 32084/61. Over $10,000.

New York—BA 6/29—State Dpt. P. Wks., State Office Bldg., Albany, SOIL EXPLORATIONS and FDN. INVESTIGATIONS at various sites on Interstate Rte. 505, East Glen Ave. to Sizer St., new Proj. No. 1-81-2(22) 77, old Proj. No. 1-1127(6), Item 72B, City of Syracuse, Onondaga Co. Contr. Spec. No. FA-SM-183. $19,110. Plans deposit $5.

New York—BA 6/30—President Queens Boro, Rm. 228, Queens Boro Hall, 120-55 Queens Blvd., New Gardens Zone 24, (1) COMBINED SEWER, 247 St. from Deepdale Ave. to point about 10 ft. south of Thebes Ave. to be restricted to sanitary flow only until such time that storm outlet is built, Third Ward; (2) COMBINED SEWER, 89 Ave. from 89 St. to point 70 ft. west 89 St., Fourth Ward.; (3) STORM SEWER, 222 St. from Carson St. to 138 Rd., Fourth Ward; (4) SANITARY SEWER, 90 Ave. from built manhole about 475 ft. west of 247 St. to Cross Island Parkway, Fourth Ward; (5) SANITARY SEWER from built manhole within intersection of 15 Ave. and 129 St. to sewer easement southwesterly therefrom; westerly within sewer easement from 129 St. to 128 St; westerly to center line of 128 St.; and 128 St. from 18 Ave. to point about 45 ft. south of 14 Ave., Third Ward; (6) SANITARY SEWER southerly side of 147 Ave. from point about 146 ft. west to point about 10 ft. west, respectively of intersection of prolongation of southerly line of 235 St; across 147 Ave. to built chamber in 147 Ave. Fourth Ward; (7) COMBINED SEWER, Merrick Blvd. north side from built manhole about 170 ft. east of 243 St. to point about 150 ft. west of Hook Creek Blvd. Fourth Ward; (8) SANITARY SEWER 231 St. from 147 Ave. to 148 Ave. and grading 231 St. from point about 35 ft. north of 148 Ave. to point about 695 ft. north of 148 Ave. and constr. ramps and seepage basins from these points to existing surface of 148 Ave. and 147 Ave. respective, Fourth Ward; (9) AUTOMATIC ELECTRIC PUMPING STATIONS within an Island of Safety in Seagirt Blvd. south side approx. at Beach 9 St. etc. Fifth Ward, Queens Boro. Plans deposit $15. Contr. 9. $1.50 Contr. 8, all other are 50c each.

New Jersey—BA 6/30—State Hy. Dpt., 1035 Parkway Ave., Trenton, MODERNIZING UNDERGROUND ELECTRICAL SYSTEM serving highway lights on Rte. 1 and 9, Newark, Essex County. CD 4/18/55, under Streets and Roads.

N. Y., **Garden City**—BA 7/6—Village of Garden City, Inc., 351 Stewart Ave., Contr. 1, general contract, Contr. 2, furnaces and equipment; Contr. 3, heating; Contr. 4, plumbing, Contr. 5, electric, Contr. 6, chimney, INCINERATOR, Cherry Valley Rd. adjacent to existing incinerator. $600,000. CD 6/1/61.

New **York**—BA 7/21—New York City Transit Auth., Rm. 1310, 370 Jay St., Brooklyn Zone 1, ADDNL. ENTRANCE north side Roosevelt Ave. to Main St. Station of Flushing Line, Contr. YE, Queens Boro. Bids Apr. 7 rejected LB **$118,813**. CD 4/11/61, under LB.

BUILDINGS—BA

† **Md., Annapolis**—BA 6/26—Area P. Wks. Office, Chesapeake, U. S. Naval Weapons Plans, Wash., D. C., SHIP SERVICE ADDNS., Bldg. 125, U. S. Naval Radio Station. NBy 32441. $100,000-$250,000. CD 8/19/60.

N. Y, Port Washington—BA 6/26—Sands Point Synagogue, c/o Katz, Waisman, Blumenkranz, Stein & Weber, archts., 551 5 Ave., New York, N. Y., SYNAGOGUE ADDN. $600,000. CD 3/29/61, under LB.

▲ **N. Y., New York**—BA 6/29—Deputy Supt. of Schools, Bureau Constr., 42-15 Crescent St., 4th Floor, Long Island City Zone 1, Proj E-459, general constr., plumbing and drainage, heating and ventilating, PUBLIC SCHOOL 154, W. 127 St. and 8 Ave., Manhattan Boro. Extended date. $2,400,000. Plans deposit $25 CD 5/22/61.

D. C., Wash.—BA 7/6—D. C. Govt. Dpt. Bldgs. and Grounds, 499 Pennsylvania Ave., NW, Kenilworth ELEMENTARY SCHOOL ADDN. 44th and Nash Sts., NE. CD 5/29/52.

▲ **N. J., Glassboro**—BA 7/6—Division Purchase & Property, State Treasurer Office, State House, Trenton, DORMITORIES, Glassboro State College. $1,566,000. Eshbach & Pullinger, 1519 Walnut St., Phila., Pa., archts. CD 11/7/60.

▲ **Pa., Johnsonburg**—BA 7/13—Pa. Pub. School Bldg. Authority, 101 S. 25th St., Harrisburg, secondary SCHOOL, for Johnsonburg Area Jt. School Board, Proj. No. A6-674, $1,500,000. Plans deposit $50. E. G. Good, Jr., 904 N. 2nd St., Harrisburg, archt. CD 4/1/59.

▲ **Pa., Hopewell**—BA 7/18—Pa. Pub. School Bldg. Authority, 101 S. 25th St., Harrisburg, secondary SCHOOL, for Northern Bedford County Jt. School Board, Proj. D2-711, $1,500,000. Plans deposit $50. Hunter, Campbell & Rea, 3601 5th Ave., Altoona, archts. CD 12/20/60.

HEAVY CONSTRUCTION—LB & CA

▲ **Gull Contg. Co. Inc.**, 33-15 Lawrence St., Flushing, N. Y., LB **$4,284,078** Alt. A, LB **$4,305,493** Alt. B (10 bidders) GRADING, PAVING, constr. grade separation structures, retaining walls, curbs, walks, drainage facilities, electrical sys, and landscaping Brooklyn-Queens Expressway (Connecting Hy.) from Woodside Ave. to 64 St., exclusive of Long Island R. R. Bridge, Queens Boro, NEW YORK. President Queens Boro, Boro Hall, Rm. 228, 120-55 Queens Blvd., Kew Gardens 24, N. Y. BA 6/13. CD 5/16/61.

Parisi & Son Inc., 54-66 48 St., Maspeth, N.Y., LB **$238,440**. COMFORT STATION and CONCESSION BLDG. Jacob Riis Park, Addn. south of Rockaway Beach Blvd. west of Beach 149 St., Queens Boro, NEW YORK. Comr. Parks, Arsenal Bldg., Central Park, 64 St. and 5 Ave., New York 21, N.Y. BA 6/9. CD 5/31/61.

Spezio Constr. Co., 1100 Lee Rd., Rochester, N. Y., CA **$132,356**, 7 mi. WATER LINES from Monroe County Line into Wayne Co. to here, MACEDON, N.Y. Town Bd., Macedon, N.Y.

Peduto Bros. Inc., 693 E.234 St., New York 66, N.Y., LB **$58,400**, (10 bidders) hauling and laying WATER MAINS, Marginal, Worth, E.104, E.105, E.108, E.109 and W.24 Sts., Manhattan Boro, NEW YORK, N. Y. Comr. Water Supply, Gas & Electricity, Rm. 2351, Municipal Bldg., New York 7, N.Y. BA 6/9 CD 5/31/61.

▲ **General Electric Co.**, 570 Lexington Ave., New York 22, N. Y., CA **$1,291,131** furnishing, installing POWER EQUIPMENT, consisting rectifier substations, feeder cables, control circuits and certain other electrical facilities and connections, Chrystie St. Connection, IND Div., New York City Transit System, Contr. No. P-202, NEW YORK, N. Y. New York City Transit Auth., Rm. 1310, 370 Jay St., Brooklyn 1, N. Y. BA 6/2. CA 6/13. CD 6/6/61, under LB.

Consolidated Diesel Electric Corp., 880 Canal St., Stamford, Conn., CA **$542,600** furnishing, installing AIR COOLING and VENTILATION EQUIPMENT for Grand Central Signal Tower, Lexington Ave. Line IRT Div. and City Hall Signal Tower, Broadway Line-BMT Div., Contr. E-231, PA, Manhattan Boro, NEW YORK, N. Y. New York City Transit Auth., Rm. 807, 370 Jay St., Brooklyn 1, N. Y. BA -5/19, CA 6/13. CD 5/24/61, under LB.

▲ **William A. Curtis Corp.**, 1269 Brighton-Henrietta Town Line Rd., Rochester, N. Y., CA **$1,107,173** laying 17 mi. SEWER PIPE, Gates-Chili-Ogden Sewer District, ROCHESTER, N. Y. Monroe County Sewer Agency, 406 Terminal Bldg., Rochester, N.Y. BA 4/25 CD 5/4/61, under LB.

Melwood Constr. Corp., 507 Fifth Ave., New York 17, N. Y., CA **$937,000**, NORTHBOUND CONNECTION from Henry Hudson Parkway to New York approach to George Washington Bridge, Contr. GWB-190.119, NEW YORK and NEW JERSEY. Port of New York Auth., Rm. 1115, 111 Eighth Ave., New York 11, N. Y. BA 6/1. CD 6/5/61, under LB.

Vanguard Constr. Co., 369 Lexington, New York 17, N. Y., LB Est. over **$88,000**, INDUSTRIAL WASTE TREATMENT FACILITY, BARRINGTON, N. J. Owens Corning Fiberglass Corp., Fiberglass Rd., Barrington, N. J. CD 3/30/61.

Mal-Bros. Contg. Co., Fairfield Ave., West Caldwell, N. J., CA **$523,375**, Contr. EP-110.014, Elizabeth Port Authority Piers, PAVING, UTILITIES BLDGS., Nos. 121, 122, 125 and 126, ELIZABETH, N. J. Port of New York Auth., 111 8th Ave., New York, Zone 11, N. Y. BA 5/25/61. CD 5/29/61, under LB.

▲ **All State Assoc., Inc.**, 251½ Grove Ave., Verona, N. J., LB **$401,810**, est. $400,000, Schedules 1 and 2, STORM DRAINS, Bedle Place, Worth Ave. and Klem Ave., LINDEN, N. J. City, City Hall, Linden, N. J. BA 6/1/61. CD 5/19/61.
United Foundation Corp., 350 Princeton Rd., Union, N. J., LB **$643,424**, Schedules 1, 2 and 3, STORM DRAINS (Linden, N. J.).

Mal-Bros. Contg. Co., Fairfield Ave., West Caldwell, N. J., CA **$511,000**, Contr. PN-140.033, PAVEMENT, UTILITIES and RAILROAD TRACKS at Berths 34, 36 and 65 south of the Norton, Lilly Terminal, Newark Bay and along north side Elizabeth Channel, PORT NEWARK, N. J. Port of New York Auth., 111 Eighth Ave., New York, Zone 11, N. Y. BA 5/18/61. CD 4/20/61.

▲ **PENNSYLVANIA**—State Hy. Dpt., 506 North Office Bldg., Harrisburg, Bids opened 6/8, ROAD,
Middlecreek Constr. Co., Winfield, Pa., LB **$2,347,852**, 47,487 ft. divided hy. cr. agg. base with bit. surf., variable in width; each side 4 ft. divisor; some widening existing hy., 1 bridge, T.R. 15, Snyder-Union Counties. CD 5/17/61.

▲† **C. W. Regan, Inc.**, 327 Hewes St., Brooklyn, N. Y., LB **$1,894,000** (8 bidders) ELECTRICAL DISTRIBUTION SYSTEM EXPANSION, Frankford Arsenal, ENG-18-020-61-26, PHILA, PA. U. S. Eng., 24th. & Maryland Ave., Baltimore, Md. BA 6/13/61. CD 6/8/61.

DELAWARE—State Hy. Dpt., Highway Administration Office, Dover, Bids opened 6/7, BRIDGES,
Burger Constr. Co., Walker Rd. and Railroad Ave., Dover, Del., LB **$245,998**, (4 bidders) twin bridges over Haven Lake at Milford, extending south from Milford, along US Rte. 113, Contract 1740-1, Kent and Sussex Counties. CD 5/22/61.

▲ **MARYLAND**—State Rds. Comn., 300 W. Preston St., Baltimore Zone 3, ROADS,
Md.—**Geo. F. Hazelwood Co.**, Cumberland, Md., CA **$812,657**, grading, drainage, surf. 2.287 mi. relocated U. S. 40, Sideling Hill Creek to Town Hill. Contr. A-464-18-620, Allegany Co. CD 5/10/61, under LB.

Md.—**Bituminous Constr. Co.**, 3301 Ridgewood Ave., Baltimore, Md., CA **$621,313**, grading, drainage and surf. 3.8 mi. southbound lane U. S. 50 from Easton to south Rte. 565, Talbot Co. CD 5/9/61, under LB.

Southern Foundation Co., 4720 Baltimore Ave., Hyattsville, Md., LB **$213,208** (6 bidders), Contr. 2680 W&S, SEWER and WATER MAIN, Baltimore-Washington Blvd. and other streets, Beltsville, HYATTSVILLE, MD. Washington Suburban Sanitary Comn., Hamilton St., Hyattsville, Md. BA 6/12. CD 6/8/61;

Taylor Constr. Co., 8600 Jefferson St., Bethesda, Md., LB **$119,388** (7 bidders), Contr. 2685-S, SEWER, various streets in Beltsville and Home Acres, Beltsville (Hyattsville, Md.).

▲ **S. J. Groves & Sons, Inc.**, Simpson Ferry Rd. & Rte. 15, Camp Hill, Penn., LB **$2,473,462**, (7 bidders) Anacostia Freeway, Pennsylvania Ave. Interchange, WASH., D. C., D. C. Govt. Dpt. Hys., 499 Pennsylvania Ave., NW, Wash., D. C. BA 6/12/61. CD 6/7/61.

BUILDINGS—LB & CA

Adson Industries, Inc., 116-55 Queens Blvd., Forest Hills, N. Y., CA **$618,900** DORMITORY for Interns and Residents, 49 St. and 9 Ave., BROOKLYN, N. Y. Maimonides Housing Co., Inc., 4802 10 Ave., Brooklyn 10, N. Y. BA 5/17, CA early June. CD 5/22/61, under LB.

Rand Constr. Co. Inc., 386 Park Ave. South, New York 16, N. Y., LB **$674,800** (7 bidders) 3 story brick men's DORMITORY No. 4, BROOKVILLE, N. Y. C. W. Post College, Northern Blvd., Brookville, N. Y. BA 6/8. CD 6/1/61.

▲ **The John W. Cowper Co., Inc.**, 1945 Sheridan Dr., Buffalo, N. Y., LB **$2,666,616**, (7 bidders), general contract 8 story pile fdn. OFFICE, Proj. 16544, BUFFALO, N. Y. State Dpt. P. Wks., State Office Bldg., Albany 1, N. Y. BA 6/7. CD 5/11/61;
Quackenbush Co., Inc., 50 Franklin St., Buffalo, N. Y., LB **$594,774**, (5 bidders), heating, Office (Albany, N. Y.);
Frey Electric Constr. Co., Inc., 225 French St., Buffalo, N. Y., LB **$564,300**, (7 bidders), electric, Office (Albany, N. Y.).

Freeport Housing Auth., 30 Albany Ave., Freeport, N. Y., cancelled bids to have been opened June 8, 1 and 2 story HOUSING for the ELDERLY, South Main St. near Raynor St. $530,900. Will re-advertise. CD 6/5/61.

A. Testa & Sons Building Contractors, Inc., Hillsdale, N. Y., LB **$467,574**, ELEMENTARY SCHOOL ADDN. and Roeliss Jamsen CENTRAL HIGH SCHOOL ADDN., alterations, HILLSDALE, N. Y. Town, Bd. Educ. Supt. Schools, Roeliss Jamsen School, Hillsdale, N. Y. BA 6/7. CD 5/26/61.

▲ **Walter Kidde Constructors Inc.**, 19 Rector St., New York 6, N. Y., CA Est. **$5,000,000**, 250,000 sq. ft. OFFICE, Wenga Farm for General Products and Data Systems, IBM Div., NE CASTLE, N. Y. International Business Machines Corp., 590 Madison Ave., New York 22, N. Y. BA 4/28, CA 6/13. CD 4/27/61.

▲ **Christensen Constr. Corp.**, 1136 Morris Park Ave., New York 61, N. Y., CA Est. over **$1,000,000**, COMMERCIAL BLDG. alterations, 122-130 East 23 St., NEW YORK, N. Y. Underwood Corp., 1 Park Ave., New York 16, N. Y. Karl Blomberg, 16 Court St., Brookyln 1, N. Y., archt.

▲ **Otis Elevator Co.**, 260 11th Ave., New York 1, N. Y., CA **$2,129,331**, AUTOMATIC ELEVATORS, Municipal Bldg., Chambers and Centre Sts., Manhattan Boro, NEW YORK, N. Y. Dpt. P. Wks., Rm. 1800 L, Municipal Bldg., New York 7, N. Y. BA 5/10. CD 5/12/61, under LB.

HORSE SENSE
•
•
•
FROM IMAGINATION

Famous Grating Ideas Made Practical!

The Irving record of technical "horse sense" speaks for itself. Listed below are some of the highlights from the Irving company's half century of experience at making grating ideas materialize.

1912 First open steel flooring for industrial plants.

1916 First steel mesh armoring in surface of heavy duty concrete industrial floors.

1917 First open steel mesh for ship walkways.

1927 First open steel mesh for runways on freight car tops.

1927 First continuous grating (one piece for any length and width)

1932 First open steel mesh decking for use on bridges.

1940 First use of portable emergency landing mats for airplanes (U. S. Army).

1943 First open mesh roadway armoring for highways.

1959 First fabrication of magnesium grating.

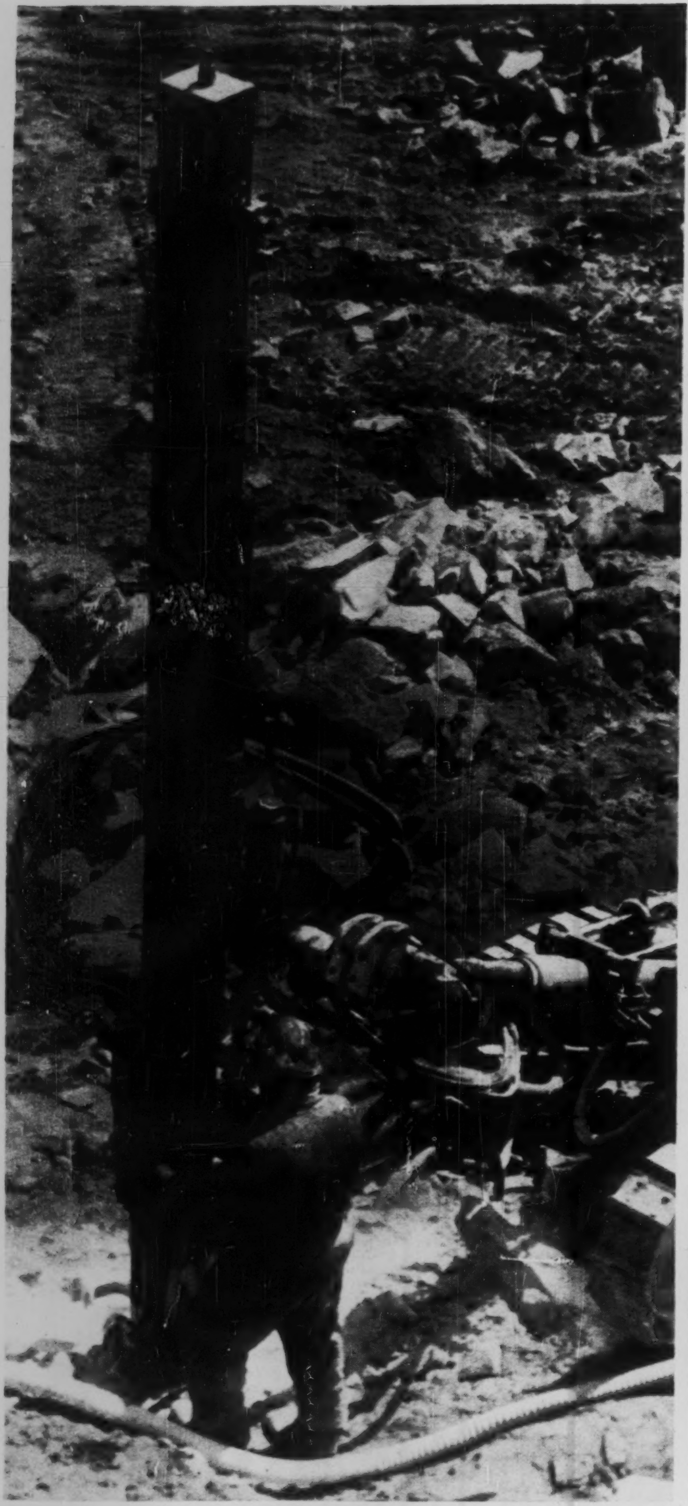
Manufacturers of Riveted, Welded, or Pressure Locked Gratings in steel, aluminum and other metals.

Catalog on request

IRVICO

IRVING SUBWAY GRATING CO., Inc.
Originators of The Grating Industry Est. 1902
Offices and Plants at:
5063 27th St., LONG ISLAND CITY 1, N.Y.
1863 10th St., OAKLAND 20, CALIFORNIA

CIRCLE 259 ON READER SERVICE CARD



ROCK AND RUBBLE is never a problem for a G-900. Two sets of grouped controls . . . one at turret, one at boom end . . . save driller time and steps . . . keep him banging down blast holes right on schedule.

MUD, MUCK OR MIRE...the new G-900 takes bad going right in stride. You can always tram into position no matter how tough the going . . . stay put when set.

any ground is right for a Tracdril!

Hard-slugging, easily controlled G-900's can lick your toughest drilling problems . . . keep coming back for more

Tough terrain and a tight schedule often go together. Put sure-footed, hard-hitting G-900 Tracdrils on the job and the blast holes go down fast. "Boarding House Reach" (180° boom swing) pays off . . . you can drill more holes from every set-up. Shifts quickly from verticals to high horizontals . . . 11 feet at the face, or snake holes at ground level. Bad footing can't stop a Tracdril! And in spite of grades, mud and boulders, the heavy-duty brakes hold 'em where you put 'em. Brakes lock automatically the instant the tramming throttle is released.

Get complete specs on the NEW G-900! Write for SP-3267 to: **Chicago Pneumatic Tool Company, 8 East 44th Street, New York 17, N. Y.**

CP

Chicago Pneumatic

PORTABLE AIR COMPRESSORS · PNEUMATIC AND ELECTRIC TOOLS
REICHdrills · THREE-CONE AIR-BLAST BITS · ROCK DRILLS

MANHATTAN SCHIST AND GRANITE demand constant, hard-slugging action. And deep cuts demand the stamina that only a G-900 can deliver on a full shift basis day after day.

CIRCLE 261 ON READER SERVICE CARD

NOW!
Big machine performance
with "small trencher" economy!

DITCH WITCH
TRENCHER

30 H.P.
MODEL
K2

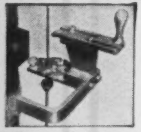
4 • WHEEL HYDRAULIC-DRIVE DITCH WITCH

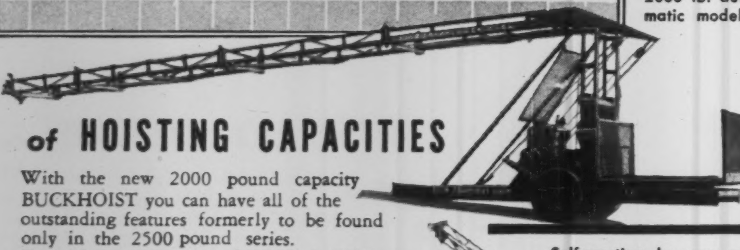
Powerful! Rugged! Ideal for distribution and service line trenching. Meets high speed trenching needs in ranges up to 6' deep, up to 16" wide. Hydraulic digging speed drive provides infinitely variable crowd speeds up to 12 FPM. Hydraulic digging boom and backfill blade are standard equipment. Slash your costs! Lower first cost—Lower maintenance cost—Lower operating cost. Call Collect for "on the job" demonstration.

Manufactured by CHARLES MACHINE WKS., INC.
640 BIRCH ST. • CALL COLLECT: FE 6-4404 • PERRY, OKLA.

CIRCLE 51 ON READER SERVICE CARD

NOW A FULL RANGE


Preset floor selector on all 2000 lb. automatic models.



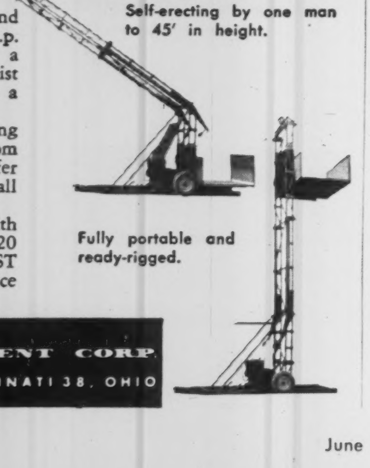
of HOISTING CAPACITIES

With the new 2000 pound capacity BUCKHOIST you can have all of the outstanding features formerly to be found only in the 2500 pound series.

Both the automatic and manual 2000 pound models are powered by a big, sturdy 15 h.p. Wisconsin Two Cylinder TH. Working in a conservative r.p.m. range this engine-hoist combination will heft a 2000 pound load at a rate of 125 f.p.m. with ease.

Combined with a 14 cu. ft. self dumping concrete bucket—poop deck and chicago boom as optional accessories the GA-20 and GM-20 offer a hard working combination for large and small contractor alike.

Fully portable, self erecting to 45' and with 30 sq. ft. of standard platform area the GA-20 and GM-20 2000 pound capacity BUCKHOIST will give the same years of reliable service demonstrated by other BUCK models.


Self-erecting by one man to 45' in height.

Fully portable and ready-rigged.

BUCK EQUIPMENT CORP.
720 ANDERSON FERRY RD., CINCINNATI 38, OHIO

▲ **Kayfield Constr. Corp.**, 130 Cutter Mill Rd., Great Neck, N. Y., LB **$831,900** (4 bidders) general contract SERVICE WING at Metropolitan Museum of Art, 5 Ave. at 82 St., Central Park, Manhattan Boro, NEW YORK, N. Y. Comr. Parks, Arsenal Bldg., Central Park, 64 St. and 5 Ave., New York 21, N. Y. BA 6/8. CD 5/15/61;
Norman Heating Co., Inc., 26-16 Skillman Ave., Long Island City 1, N. Y., LB **$536,163** (4 bidders), heating, ventilating and air-conditioning Service Wing, Metropolitan Museum of Art, (New York, N. Y.).

▲ **Terminal Constr. Corp.**, State Hy. 17, Wood-Ridge, N. J., CA **$3,711,375** Proj. NR-5-32 fdns. and general contract Samuel Gompers HOUSES, incl. Bldgs. 5 and 6, Hamilton Fish Park, Willett St., Delancey St. and Pitt St., Manhattan Boro, NEW YORK, N. Y. New York City Housing Auth., Purchase Div., Rm. 1002, 299 Broadway, New York 7, N. Y. BA 5/9. CA 6/8. CD 5/11/61 under LB;
Glass Bros. Inc., 2623 Jerome Ave., New York 68, N. Y., CA **$638,711** plumbing Samuel Gompers HOUSES, Manhattan Boro (New York, N. Y.).

▲ **The Welsbach Corp.**, 1500 Walnut St., Phila., Pa., LB **$2,912,907**, (9 bidders), heating for TEACHING HOSPITAL, SYRACUSE, N. Y. State Dpt. P. Wks., State Office Bldg., Albany, N. Y. BA 6/7. CD 5/2/61;
J & K Plumbing & Heating Co., Inc., 24 Thorpe St., Binghamton, N. Y., LB **$1,543,292**, (6 bidders), sanitary work for Teaching Hospital (Syracuse, N. Y.);
Rao Electrical Equipment Co., Inc., 314 E. 39 St., New York 16, N. Y., LB **$1,930,000**, (6 bidders), electric work, Teaching Hospital (Syracuse, N. Y.);
Otis Elevator Co., 1 Columbia Place, Albany, N. Y., LB **$775,988**, (3 bidders), elevator, Teaching Hospital (Syracuse, N. Y.).

▲ **The Malan Constr. Corp.**, 2 Park Ave., New York, N. Y., LB **$10,150,000**, 8 story 600,000 sq. ft. UNIVERSITY TEACHING HOSPITAL MEDICAL CENTER, SYRACUSE, N. Y. State Dpt. P. Wks., State Office Bldg., Albany, N. Y. BA 6/7. CD 5/2/61.

▲ **Walter Kidde Contractors Inc.**, 140 Cedar St., New York, N. Y., CA **$5,343,000**, 5 story HOSPITAL ADDN., South Broad St., ELIZABETH, N. J. St. Elizabeth's Hospital, 204 South Broad St., Elizabeth, N. J. BA 6/5/61. CD 6/12/61 under LB.

▲ **Clifford Evans, Inc.**, 640 Passaic Ave., West Caldwell, N. J., CA general contract, 1 story, bsmnt., Family YMCA, pool, gymnasium, between King's Rd. and Keep St., MADISON, N. J. Madison Young Men's Christian Assn., 16 Main St., Madison, N. J. Total est. approx. **$1,000,000**. BA 5/25/61. CD 4/23/61;

Air Con Inc., 1148 U. S. Hy. 22, Mountainside, N. J., CA heating and ventilating contract, Family YMCA, (Madison, N. J.);

McManus & Murray, Inc., 30 Canfield St., Orange, N. J., CA plumbing contract, Family YMCA, Madison, N. J.);
Nordling, Dean & Co. Inc., 40 Middle Ave., Summit, N. J., CA electric contract, Family YMCA, (Madison, N.J.).

▲ **Arthur Venneri Co.**, 300 North Ave. East, Westfield, N. J., CA **$3,095,615**, est. $4,000,000, Bishop Campus DORMITORIES, NEW BRUNSWICK, N. J. Rutgers University, Colleye Ave., New Brunswick, N. J. BA 5/16/61. CD 5/24/61, under LB.

Joseph P. Houseman, 1 Leonard St., Metuchen, N. J., CA **$756,000**, est. $1,000,000, CHURCH and SCHOOL, Glendale Rd., Colonia, WOODBRIDGE, N. J. Diocese of Trenton, Chancery, State St., Trenton, N. J. and Parish St. John Vianney, 47 Glendale Rd., Colonia, N. J. CD 10/27/60.

▲ **Henry A. Knott, Inc.**, 2406 Greenmount Ave., Baltimore 18, Md., LB **$1,107,000**, est. $1,300,000, (8 bidders), CAFETERIA ADMINISTRATION BLDG. and 3 DORMITORIES, Spring Grove Mental State Hospital, CATONSVILLE, MD. State, Dpt. P. Imprvts., 301 W. Preston St., Baltimore 1, Md. BA 6/6. CD 5/22/61.

▲ **Magazine Bros.**, 1730 K St. N.W., Wash., D. C., CA **$2,500,000**, 7 story 175 unit APARTMENT with recreation rooms to be protected against fallout radiation, Toledo Terrace, Belcrest Rd. and Northwest Dr., HYATTSVILLE, MD. Marvin & Herschel Blumberg, 1730 K St. N.W., Wash., D. C. Berla & Abel, 2000 P St., N.W., Wash., D. C., archts.

Opha Mays 2710 Fairland Rd., Silver Spring, Md., LB **$546,943**, (4 bidders), Du Val HIGH SCHOOL ADDN., Glendale, MARLBORO, MD. Prince Georges County Bd. Educ., Marlboro, Md. BA 6/6. CD 5/26/61.

▲ **American Constr. Co.**, 261 Constitution Ave., NW, Wash., D. C., CA Est. **$6,000,000**, 12 story OFFICE BLDG. 718 18th St., NW, WASH., D. C. International Bank of for Reconstruction and Development, 1818 H St., NW, Wash., D. C. Chatelain, Gauger & Nolan, 1632 K St., NW, Wash., D. C., archts.

▲ **Abe Pollin**, 6101 16th St., NW, Wash., D. C., Owner Builds, **$3,000,000**, 10 story, 243 unit APARTMENT HOUSE and OFFICES, 1330 New Hampshire Ave., NW, WASH., D. C. Berla & Abel, 2000 P St., NW, Wash., D. C., archts.

▲ **Standard Construction Co.**, 1000 Connecticut Ave., NW, Wash., D. C., CA Est. **$3,000,000**, 8 story, 146 unit, APARTMENT, 4101 Cathedral Ave., NW, WASH., D. C. William Magazine and Charles Kaplan, 1000 Connecticut Ave., NW, Wash., D. C. Corning, Moore, Elmore & Fischer, 1302 18th St., NW, Wash., D. C., archts.

SOUTH

HEAVY CONSTRUCTION—BA

Ala., Birmingham — BA 6/27 — Industrial Water Bd., City, City Hall, electrical work at intake pumping station and booster pumping station and appurtenances, $400,000. J. W. Goodwin Engineering Co., 2111 7th Ave., S. Birmingham, Ala., engr. Extended date. CD 5/15/61.

† **Fla., Cocoa**—BA 6/27—Procurement Office, Air Force Missile Test Center, Patrick Air Force Base, positive operation of REMOTE SHUTOFF VALVES, processed water system, complexes 16, 19 and 20, Cape Canaveral, IFB-08-606-61-227. $25,000-$100,000. CD 10/6/60.

† **N. C., Hertford**—BA 6/27—Dist. P. Wks. Office, 5th Naval Dist., US Naval Station, Norfolk, Va., FACILITY IMPRVS. BUILDING MODIFICATIONS, Harvey Point Special Testing Activity, Harvey Point Contract NBy 37110, Spec. 37110/61, $100,000 to $250,000. CD 9/8/58.

▲ **S. C., Greer**—BA 6/27—Greenville-Spartanburg Airport Comn., P.O. Box 5133-B, Greenville, Phase 1, grading and clearing JET AIRPORT, $1,570,000. Plans deposit $70. Skidmore, Owings & Merrill, 425 Park Ave., New York, N. Y., archt.-engrs. CD 4/20/59.

Tenn., Oneida — BA 6/27 — City, City Hall, WATER TREATMENT PLANT, over $100,000. Plans deposit $25. J. Sanders Parker Engineers, Inc., 745 Berry Rd., Nashville, engr. CD 11/12/58.

† **Va., Charlottesville**—BA 6/27—Dist. P. Wks. Office, Fifth Naval Dist., Room 307, Bldg. N-26, U. S. Naval Station, Norfolk, REHABILITATION TRAINING CENTER, Marine Corps Reserve Training Center, NBy-37119, Spec. No. 37119/61. Under $10,000.

† **Va., Norfolk**—BA 6/27—Dist. P. Wks. Office, Fifth Naval Dist., Room 307, Zldg. N-26, U. S Naval Station, AIR CONDITIONING HANGARS LP-2, LP-3, LP-4 and LP-13, Naval Air Station, NBy-36964, Spec. No. 36964/61. $25,000-$100,000.

† **Va., Norfolk**—BA 6/27—Dist. P. Wks. Office, Fifth Naval Dist., Room 307, Bldg. N-26, U. S. Naval Station, RELINING FUEL TANKS, Naval Air Station, NBy-37105, Spec. No. 37105/61. $25,000-$100,000.

† **Va., Norfolk**—BA 6/27—Dist P. Wks. Office, Fifth Naval Dist., Room 307, Bldg. N-26, U. S. Naval Station, INSTALLATION HIGH BAY LIGHTING, West Wing, Bldg. V-28, Naval Air Station, NBy-37081, Spec. No. 37081/61. Under $25,000.

† **Va., Oceana**—BA 6/27—Officer in Charge of Constr., Bldg. 830, U. S. Naval Air Station, Oceana, Virginia Beach, repairs RUNWAY PAVING, Naval Air Station, NBy 33713. $10,000. CD 7/25/60.

† **Ga., Marietta**—BA 6/28—Southeast Division, Bureau Yards and Docks, Bldg. 13, U. S. Naval Base, Charleston, S. C., AIRCRAFT PARKING APRON ADDN. (second increment) U. S. Naval Air Station, Atlanta, NBy-25489, Spec. 25489/59. $250,000-$100,000.

Fla., Miami—BA 6/28—Dade Co. Bd. Comrs., 10th Floor Courthouse, 114 lin. ft., 2 lane prestressed conc. BRIDGE, piling, excavation, approaches, Old Cutler Road Bridge over Black Creek. CD 7/22/43.

Ala., Montevallo—BA 6/29—City, City Hall, SANITARY SEWER, collector and outfall sewers. $275,000. Plans deposit $50. Goodwin Engineers of The South, Inc., 2111 7th Ave., S. Birmingham, Ala., engr. CD 5/16/61.

Kentucky—BA 6/29—Commonwealth Ky., Div. Purchases, Frankfort, 25-room LODGE, DINING FACILITIES and SWIMMING POOL, General Butler State Park, Carroll Co. $500,000. Plans deposit $50. Braun & Ryan, Heyburn Bldg., Louisville 2, Ky., archts.-engrs. CD 1/3/57.

Ky., Lexington—BA 6/29—Commonwealth Ky., Div. Purchases, Frankfort, 41,000 sq. ft. ADMINISTRATION BLDG. for Industrial Research. $900,000. Plans deposit $50. Frankel, Curtis & Coleman, 130 Barr St., Lexington, Ky., archts. E. R. Ronald & Assoc., 554 S. 3 St., Louisville 2, Ky., engrs. CD 10/10/60.

Tenn., Rockwood—BA 6/29—City and Tennessee Bureau of Aeronautics, Berry Field, Nashville, AIRPORT RUNWAY grading and paving, $768,000. Plans deposit $20. John T. Talbert Jr. & Associates, P.O. Box 1394, Wilmington, N. C., engrs. CD 3/8/61.

Fla., Hollywood—BA 7/6—City, City Hall, raw WATER FACILITIES, $65,000. Plans deposit $10. Reynolds, Smith & Hills, 4019 Center Blvd. Drive, Jacksonville, Fla., engrs. CD 6/6/57.

† **Va., Norfolk**—BA 7/6—Dist. P. Wks. Office, Fifth Naval Dist., U. S. Naval Station, ANNUAL ASP. PAVING CONTRACT, Sewells Point area incl. Naval Air Station, NBy-37107, Spec. No. 37107/61.

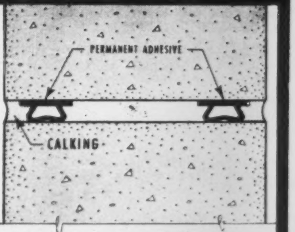
† **Fla., Cocoa**—BA About 7/11—U. S. Eng., P.O. Box 4970, Jacksonville, Zone 1, construction of SECOND ELEVATOR for Complex 36, Cape Canaveral Missile Test Annex, Air Force Missile Test Center, Patrick Air Force Base, ENG-08-123-61-96. $50,000. CD 10/6/60.

† **Louisiana**—BA 7/11—U. S. Eng., foot of Prytania St., New Orleans, RECREATION AREA FACILITIES, comfort station, Bayou Bodcau Reservoir approx. 24 mi. northeast of Shreveport. CIVENG-16-047-61-188. Under $25,000. CD 9/20/60.

Va., Timberville—BA 7/11—Town, Town Hall, 250,000 gal. steel WATER STORAGE TANK, Division II; 12,330 lin. ft. 6, 8, and 10 in. WATER MAINS, Division I. Plans deposit $30 each. Wiley & Wilson, 620 Court, Lynchburg, Va., engrs.

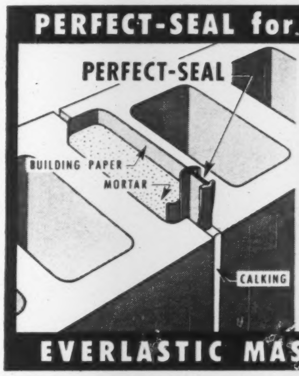
RUBBER or VINYL
SEALS and GASKETS
for PRECAST CONCRETE PANELS

Williams Panel Seals (Pats. Pend.) were developed especially for use in vertical and horizontal joints of precast concrete wall panels . . . they are extrusions of expanded, closed-cell Neoprene Rubber. This closed-cell material, and the hollow-core design, provide the properties which assure a positive pressure-contact seal in panel joints under all conditions—each type of seal readily compensates for variations in joint width, irregular joint surfaces and erection adjustments.



VERTICAL JOINT
6" Precast Concrete Panel

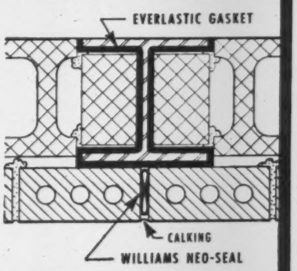
PERFECT-SEAL for CONTROL JOINTS



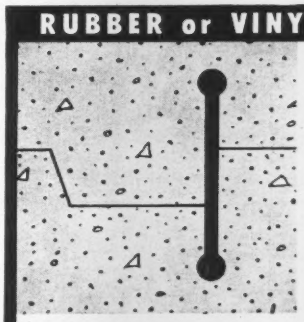
Williams "Perfect-Seal" (Pat. Pend.) is a specially designed seal for use in Mortar-Keyed Control Joints . . . it provides continuous four-point pressure-contact sealing which keeps moisture out of joints and prevents air passage. The T-Section is a high-grade rubber compound; the cross-sealing member at the base of the "T" is a strip of readily compressible, non-absorbent, expanded closed-cell Neoprene Rubber—it provides an effective pressure-contact seal directly behind the calking.

EVERLASTIC MASONRY GASKETS

Everlastic Masonry Gaskets are a readily compressible, nonabsorbent Elastomer which is impervious to water and inert to heat, cold and acids. In masonry joints, they permit linear expansion, and seal the joints against moisture penetration which causes frost damage. Everlastic Gaskets should be used between sill and coping stones, stone or prefab metal wall panels, and to isolate and cushion all steel or concrete columns to permit normal movement without damage to masonry walls.



RUBBER or VINYL WATERSTOPS



Williams Waterstops are made from Natural Rubber Stock and designed for maximum effectiveness in any type of cast-in-place construction joint. They will bend around corners, and will not crack or tear from shear action. Tensile Test: 3990 lbs., Elongation Test: 650%. Available in rolls up to 80 feet in length. Molded union and junction fittings available. Williams Waterstops can be furnished in Vinyl or Neoprene for industrial uses where resistance to oil or other injurious wastes is desirable.

See Sweet's Files, or Write for Information.

WILLIAMS
EQUIPMENT and SUPPLY CO.
486 W. Eight Mile Rd., Hazel Park, Michigan

† **Va., Chantilly**—BA 7/13—Federal Aviation Agency, 16th St. and Constitution Ave., N W., Wash. D. C., WEST SERVICE BUILDINGS, PAVING and UTILITIES, Dulles Internation Airport, No. S2-25B1. Plans deposit $50. Small Business set-aside. CD 7/23/51, under Burke, Va.

† **Tennessee**—BA 7/18—U. S. Eng., P.O. Box 97, Memphis, Zone 1, PILE DIKE CONSTR. at Robinson Crusoe, Mile 737AHP, ENG-40-041-61-105, $100,000-$400,000.

† **West Virginia**—BA About 7/18—U. S. Eng., P. O. Box 2127, Huntington, Zone 18, LOCAL PROTECTION PROJECT, Williamson, Mingo Co., on right descending bank of Tug Fork on Big Sandy River, CIVENG-46-022-61-70, approx. $500,000 (Small Business Set-Aside) Plans deposit $1. CD 10/30/58.

BUILDINGS—BA

Ga., **Brunswick**—BA 6/26—Brunswick Pulp & Paper Co., Southern Docks, Brunswick, WAREHOUSE, loading shed, turbine room, $150,000. CD 8/18/60.

Ga., **Jackson**—BA 6/27—American Mills, 335 E. Solomon St., Griffin, Textile MFG. PLANT, $250,000. Robert & Co. Assocs., 96 Poplar St., NW, Atlanta, Ga., archts.-engrs.

† **Va., Norfolk**—BA 6/27—Dist. P. Wks. Office, Fifth Naval Dist., Zone 11, repairs to five ELEVATED WATER TANKS, Naval Station, NBy 33763. $25,000. CD 6/14/61, under LB.

Ga., **LaGrange**—BA 6/28—Calloway Mills, LaGrange, Central OFFICE, $800,000. Sam M. Turner, P.O. Box 706, LaGrange, Ga., archt. Extended date. CD 6/7/61.

Va., **Norfolk**—BA 6/28—Virginia State Port Auth., Maritime Tower, FABRICATE and INSTALL TWO GANTRY MOUNTED REVOLVING CRANES, General Cargo Terminal. Plans deposit $50. Extended date. Lockwood Greene Engineers Inc., Montgomery Bldg., Spartanburg, S. C., engr. CD 4/19/61.

▲ **Ala., Montgomery**—BA 7/7—Alabama Dpt. Educ., State Office Bldg., State Vocational TRADE SCHOOL, $1,000,000. Plans deposit $50. Johnson & Williams, 445 S. Hull St., Montgomery, Ala., archts. CD 8/4/60.

▲ **La., New Orleans**—BA 7/11—City Housing Auth., 4040 Queen and Crescent Bldg., 344 Camp St., 933 unit low-rent Wm. J. Guste SENIOR HOMES, Melpomene, Clio, Simon, Bolivar and S. Robertson Sts. $10,750,000. CD 3/17/61.

† **Va., Norfolk**—BA 7/11—Dist. P. Wks. Office, Fifth Naval Dist., U. S. Naval Station, repairs to WHARF and BREAKWATER, Naval Station, NBy-37091, Spec. No. 37091/61. $25,000 to $100,000. CD 9/8/58.

▲ **Ala., Montgomery**—BA 7/27—Bd. Trustees, Montgomery Baptist Hospital, Stakley Hall, First Baptist Church, 127-bed Montgomery Baptist HOSPITAL, $2,000,000. CD 3/8/61.

HEAVY CONSTRUCTION—LB & CA

V C Constructors Inc., 1007 East Main St., Norfolk, Va., LB **$598,069**, (5 bidders), Contract 5, Second Elizabeth River Tunnel, TOLL PLAZA and BUILDINGS, storm water pump station, Portsmouth, VIRGINIA. Elizabeth River Tunnel Comn., Berkely Plaza, Norfolk, Va. BA 6/7/61. CD 5/5/61.

▲ **VIRGINIA**—State Dpt. Hys., 1221 East Broad, Richmond, ROADS,

Va.—**Vecellio & Grogan Inc.**, 501 South Kanaloah St., P.O. Box 31, Beckley, W. Va., CA **$992,997**, Contract 3, grading, drainage, paving from Caroline county line to 0.5 mi. north Rte. 1 on Rte. 95, Proj. 0095-088-101, G303, B620, Spotsylvania Co.;

Va.—**J. R. Ford Co. Inc.**, 19th and Fillmore Sts., Lynchburg, Va., CA $737,982, 3.847 mi. bit. concrete pavement from 8.574 mi. west Stafford county line to 0.611 mi. south Southern RR on Rte. 17, Proj. 0017-030-003, C502, B602, B603, B605, Fauquier Co. BA 5/31/61. CA 6/9/61. CD 6/5/61, under LB.

† **Carpenter Constr. Co. Inc.**, National Bank of Commerce Bldg., Norfolk, Va., CA **$149,932**, REHABILITATION LOCK WALLS and BULKHEADS, 678 ft. steel bulkhead, Atlantic Inter-coastal Waterway, Great Bridge, CIVENG-44-110-61-25, VIRGINIA. U. S. Eng., foot of Front St., Norfolk, Va. BA 5/24/61. CA 6/5/61: CD 6/7/61, under LB.

† **Permanent Builders, Co.**, Bladensburg, Md., CA **$508,365**, SEWAGE TREATMENT PLANT No. 2 imprvs., ENG-49-080-61-45(43), FORT BELVOIR, VA. U. S. Eng., First and Douglas Sts., N.W., Wash., D.C. BA 5/16/61. CA 6/6/61. CD 4/26/61.

▲† **Humphreys & Harding**, 1608 New Hampshire Ave., N.W., Wash., D. C., CA **$7,934,500**, completion TERMINAL BLDG., Dulles International Airport, CHANTILLY, VA. Federal Aviation Agency, Temporary Bldg. 5, 16th and Constitution Ave., N.W., Wash., D. C. BA 4/27/61. CD 5/1/61, under LB.

† **Ocean Electric Co., Inc.**, P.O. Box 12270, Norfolk, Va., LB **$238,000**, est. $245,000, REHABILITATION SECONDARY DISTRIBUTION and SERVICE, HTA Area, IFB-44-600-61-118, LANGLEY AIR FORCE BASE, VA. Base Procurement Office, Langley Air Force Base, Va. BA 5/23/61. CD 5/9/61.

B. F. Parrott & Co., 8th St., Roanoke, Va., CA, 111 x 117 ft., 1 story, wood piles, structural steel, masonry AIR BRAKE SHOP, NORFOLK, VA. Norfolk & Western Railway Co., 8 N. Jefferson St., Roanoke, Va., BA 5/22/61. CD 5/23/61.

G. P. Clay, P.O. Box 481, Richmond, Va., CA **$108,590**, extension McKenzie STREET to Leigh; Carver County Boundary STREETS, RICHMOND, VA. City, Dpt. P. Wks., 217 Governor St., Richmond, Va. BA 5/24/61. CD 5/1/61.

† **Hartsfield Water Co., Inc.**, Kinston, N. C., CA **$54,800**, ADDNL. WATER WELLS, (Tarawa Terrace) four deep WATER WELLS, equipment and well houses, Marine Corps Base, Proj. NBy 36996, CAMP LEJEUNE, N. C. Dist. P. Wks. Office, Fifth Naval Dist., Norfolk, Zone 11, Va. BA 5/23/61. CD 6/2/61, under LB.

A. P. White & Assocs., P.O. Box 264, Charlotte, N. C., LB **$159,375**, Contract 1, SEWER COLLECTION LINES, KANNAPOLIS, N. C. Royal Oaks Sanitary Dist., Florida Dr., Royal Oaks, Kannapolis, N. C. BA 6/6/61. CD 5/25/61;
Boyle Constr. Co., P.O. Box 471, Sumter, S. C., LB **$90,463**, Contract 2, OUTFALL SEWERS, (Kannapolis, N. C.).

Dawson Constr. Co., Stallings Ave., Kinston, N. C., LB **$66,132** STEAM CHANNEL IMPRVTS., incl. channel excavation, timber sheet piling, retaining walls, KINSTON, N. C. City, City Hall, Kinston, N.C.

Lincoln Constr. Co., Electric Bldg., Wilmington, N. C., CA Est. **$100,000**, 18 hole GOLF COURSE, SOUTHPORT, N. C. Oak Island Club, c/o D. C. Herring, Southport, N. C. George Cobb, 11 Lake Fairfield Dr., Greenville, S. C., archt.

Anderson County, Courthouse, Anderson, S. C., Owner Builds, **$200,000**, RESURF. ROADS, 1961 summer program, ANDERSON, S. C.

▲ **GEORGIA**—State Hy. Dpt., No. 2 Capitol Square, Atlanta Zone 3, ROADS,

Ga.—**Everglades Constr. Co.**, 160 E. Washington St., Orlando, Fla., CA **$1,866,330**, 4.661 mi. grading, divided lane paving on Abercorn St. extension, Federal Aid Proj. U-111-1(3) Chatham Co.,

Ga.—**E. A. Hudson's Constr. Co.**, 1730 Hollywood Rd., NW Bolton, Ga., CA **$183,226**, 3.281 mi. of grading paving on Fort Mountain State Park Road, Rural Roads P Authority RR-PR-3915(1) and spurs, Murray Co.

Ga.—**Hil Constr. Co.**, 107 Meeks Terrace, Thomaston, Ga., CA **$103,029**, 3.124 mi. grading, paving, one bridge on Tazewell-Geneva Road, Rural Roads Authority, RR-PR-2114-B(1), Talbot Co.,

Ga.—**J. G. Attawa Constr. Co.**, Box 295, Statesboro, Ga., CA **$107,250**, 6.46 mi. grading, paving near Manassas and Yeomans school on county roads, Rural Roads Authority Supp. 5-RR-PR-1421(3) and 3809(1), Tattall Co.,

Ga.—**Seaborad Constr. Co.**, Box 1437, Brunswick, Ga., CA $132,300, 3.695 mi. grading, paving, one bridge on Akin-Union Church Road, Proj. Supp. 5-RR-PR-3891(1) Wayne Co., Grand Total, $2,392,135, BA 5/19/61. CA 5/19/61. CA 5/10/61.

FLORIDA—State Road Dpt., Tallahassee, ROADS,
Cone Bros. Constr. Co., Box 1259, Tampa, Fla., CA **$716,149**, widening section existing roadway, construction sections of 4-lane municipal and rural roadway, incl. grading, limerock base, Type IB surf. treat, binder, Type IB conc. surf. course, approx. 3.644 mi., between point approx. 1 mi. south Orlando South Limits and SR 528 (Bearhead Road), State Proj. Job No. 75040-3501, SR 527, Orange Co., BA 5/30/61. CA 6/9/61. CD 6/2/61, under LB.

† **C. L. Mahoney Co., Inc.**, 320 W. Pine St., Orlando, Fla., CA **$260,411**, modification and air conditioning bldg. T-2089 for Photo Facilities, Orlando Air Force Base, IFB-08-614-61-37, ORLANDO, FLA., HQ 1360th

This Kind of EXPERIENCE
You Can Measure in PROFITS

EXPERIENCE
In Designing and Manufacturing Equipment

"Advanced Design" describes the kind of engineering thinking that goes into the creation of Airplaco pneumatic placing equipment. This advance-designing comes from years of research, testing and **specialization** in the field of pneumatic placement. Its result is equipment that will speed your jobs, lower your costs and allow you to make a **profit**.

EXPERIENCE
In Training and Certifying Your Crews

By "going that extra mile" . . . having a factory-trained man on the job to train your crew . . . Airplaco and its authorized distributors provide you with extra dividends that mean extra profits. With your operating crew properly trained and certified, your equipmen will operate at peak efficiency at all times, meaning even greater savings for you. Factory-trained service men train and certify your crews on all major Airplaco products — and at no added cost to you.

EXPERIENCE IN SOLVING YOUR PROBLEMS

Thousands of hours . . . hundreds of jobs, some unique, some routine . . . have provided our Field Engineers with a wealth of knowledge in solving problems. This experience is yours to draw upon . . . at no cost and without obligation. Tell us your problem. A letter, wire or phone call will do.

Concrete Placer
Concrete Guns—Wet or Dry
WORLD'S LEADING MANUFACTURER OF "ADVANCED DESIGN" PNEUMATIC PLACING EQUIPMENT
Mix Elvators
Wet Gun & Grout Pump
Grouters

AIRPLACO
AIR PLACEMENT EQUIPMENT CO.
1008 W. 25th St. • Kansas City 8, Mo.

WORLD'S LEADING MANUFACTURER OF "ADVANCED DESIGN" PNEUMATIC PLACING EQUIPMENT

CIRCLE 264 ON READER SERVICE CARD

Air Base Group, Air Photographic and Charting Service (MATS), USAF, Orlando Air Force Base, Orlando, Fla. CD 6/8/60.

Marshall D. Smith, P.O. Box 262, Winder, Ga., LB **$617,000,** NATURAL GAS DISTRIBUTION SYSTEM, FORT PIERCE, FLA. City, City Hall, Fort Pierce, Fla. BA 6/5/61. CD 5/16/61.

Reed A. Thursby Co., 3945 Indianapolis St., NE St. Petersburg, Fla. LB **$184,976,** PAVING, Shore Acres etc., ST. PETERSBURG, FLA. City, City Hall, St. Petersburg, Fla. CD 6/6/61.

City of St. Petersburg, City Hall, St. Petersburg, Fla., rejected bids May 26, Phase 1 and 2, MARINA, ST. PETERSBURG, FLA. CD 6/2/61, under LB.

Tallapoosa River Electric Cooperative, Lafayette, Ala., Owner Builds, **$820,000,** 90 mi. ELECTRIC LINES in Chambers, Lee, Russell, Tallapoosa, Clay, Randolph, Barbour and Cleburne, ALABAMA. CD 6/9/58.

Robins Engineering Inc., 1909 Courtney Dr., Homewood, Birmingham 9, Ala., LB **$97,841,** est. **$97,000,** (8 bidders), City RECREATION CENTER, in N. Birmingham Park, BIRMINGHAM, ALA. Park and Recreation Bd., City, City Hall, Birmingham, Ala. BA 6/6/61. CD 5/8/61.

Bd. Comrs. Madison County, Courthouse, Huntsville, Ala., Owner Builds, **$120,500,** 4.3 mi. RESURFACING county road beginning mile W. of Buggs Chapel toward New Hope, HUNTSVILLE, ALA.

† **Pearce & Gresham,** 202½ Second Ave., Box 1527, SE Decatur, Ala., CA **$923,491,** 5 story OFFICE EXTENSION mechanics division engineering bldg. George C. Marshall Space Flight Center, HUNTSVILLE, ALA. National Aeronautics & Space Administration, George C. Marshall Space Flight Center, Huntsville, Ala., BA 5/25/61, CA 6/6/61. CD 6/2/61, under LB.

J. Ray McDermott & Co., Inc., Contractors, Box 38, Harvey, La., CA **$521,688** first two phases, Harrison County Industrial SEAWAY, GULFPORT, MISS. Harrison Co. Development Comn. and Bd. Supervs. Harrison Co., Court House, Gulfport, Miss. Bedell & Nelson, 840 Union St., New Orleans, La. and 1414 23 Ave., Gulfport, Miss., engrs. BA 5/23. CD 10/27/60.

▲ **Panama, Inc.,** Tennessee Bldg., Houston, Tex., CA **$1,432,000,** 21 mi. 30 in. GAS LINE north of De-Ridder, LOUISIANA. Trunkline Gas Co., P.O. Box 1642, Houston, Tex. CD 3/11/60.

Abraham Constr. Co., Box 2870, Baton Rouge, La., LB **$445,498,** (6 bidders), SEWAGE PUMPING STATION, Sta. C2 and SEWAGE PUMPING STATION, C-4, BATON ROUGE, LA. City, East Baton Rouge Parish, Municipal Bldg., Baton Rouge, La. BA 6/8. CD 6/22/50.

▲ **KENTUCKY**—Commonwealth Ky., Dpt. Hys., Frankfort, ROAD,

Codell Constr. Co., Codell Bldg., Winchester, Ky., CA **$3,618,529,** c. conc. pavt. 4.373 mi. East Ky. Turnpike, EK2-3, Powell and Wolfe Counties. BA 5/26. CD 6/6. CD 5/31/61, under LB.

▲† **Blount Brothers Corp.,** P.O. Box 939, Montgomery, Ala., CA **$9,950,000,** PROPULSION ENGINE ALTITUDE TEST CELL, Arnold Engineering Development Center, TULLAHOMA, TENN. U. S. Eng., 2301 Airport Blvd., Mobile, Ala. BA 3/8/61. CD 3/16/61, under LB.

BUILDINGS—LB & CA

† **Head Constr. Co.,** 2601 Connecticut Ave., N.W., Wash., D. C., LB **$525,000,** (5 bidders), ARMY RESERVE CENTER, ENG-49-080-61-51-(46), ALEXANDRIA, VA. U. S. Eng., First and Douglas Sts., N.W., Wash., D. C. BA 6/8/61. CD 5/24/61.

▲ **Sharpe & Hamaker, Inc.,** 3260 Wilson Blvd., Arlington, Va., LB **$1,349,276,** (12 bidders), MEDICAL and SURGERY WING, Arlington Hospital, ARLINGTON, VA. Arlington Hospital Assoc. Inc., 5129-16th St., North, Arlington, Va. BA 6/13/61. CD 4/23/61.

Commander 5th Coast Guard Dist., Federal Bldg., Portsmouth, Va., rejected bids June 1, Hatteras Inlet LIFEBOAT STATION, HATTERAS, N. C. CD 6/7/61 under LB.

Altimore Bros. Inc., 4929 Bethesda Ave., Bethesda, Md., CA **$662,284,** Butler Hall STUDENT CENTER, Marymount Junior College, ARLINGTON, VA. Archdiocese of Virginia, 807 Cathedral Ave., Richmond, Va. BA 5/10/61. CD 5/18/61, under LB.

Robert R. Marquis Inc., 2229 County St., Portsmouth, Va., LB **$846,212** (6 bidders), 1 and 3 story, 56,500 sq. ft. 145-bed, steel, masonry Norfolk Municipal HOSPITAL ADDN., NORFOLK, VA. City Dpt. P. Wks., City Hall, Norfolk, Va. BA 6/9/61. CD 5/26/61.

Robert H. Pinnix, Inc., P. O. Box 97, Gastonia, N. C., CA Est. **$114,000,** MANUFACTURING PLANT No. 2, DAVIDSON, N. C. Twyman Co., c/o contractor.

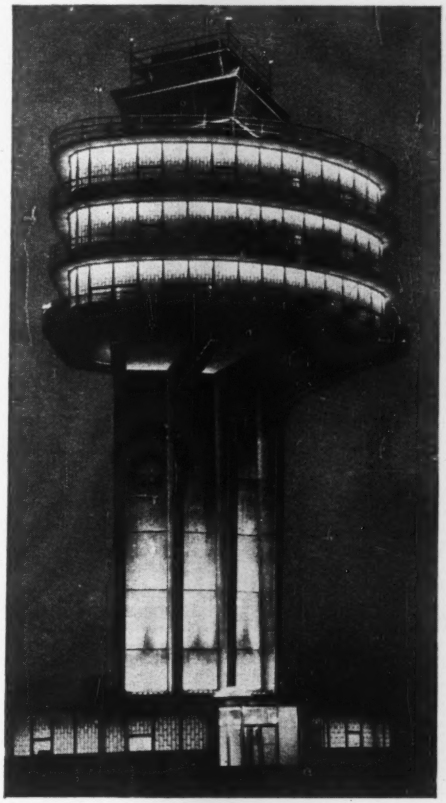
Boyle Constr. Co., P. O. Box 471, Sumter, S. C., LB Est. Over **$750,000,** FINISHING PLANT, sewing room and warehouse, DURHAM, N. C. Erwin Mills, Inc., Durham, N. C. Lockwood Greene Engineers, Inc., Montgomery Bldg., Spartanburg, S. C., archts. BA 5/23/61. CD 5/3/61.

Dover Mills, c/o Breeze, Holland & Riviere, Inc., archt., 325 Lee St., Shelby, N. C. Owner Builds. **$130,000.** TEXTILE MILL ADDN., SHELBY, N. C. CD 4/27/61.

▲ **Roberson Constr. Co.** P. O. Box 5056, Columbia, S. C., LB **$1,132,230,** PHYSICS BLDG. ADDN., arts and science classroom bldg., CLEMSON, S. C. Clemson College, Clemson, S. C. BA 6/7/61. CD 2/15/61.

▲ **Crosland-Roof Constr. Co.,** P. O. Box 1313, Columbia, S. C., CA **$1,009,630,** HOSPITAL ADDN., COLUMBIA, S. C. Providence Hospital, 2435 Forest Drive, Columbia, S. C. BA 6/8/61. CD 5/9/61.

SYLGAB CONCRETE REINFORCEMENT
SUPPORTING ACCESSORIES



used in
NEWARK AIRPORT
CONTROL TOWER
erected for the
Port of New York Authority

A. Gordon Lorimer, Architect
Strobel & Rongved, Structural Engineers
Carl Buhr, Inc., Builder

This unique design was projected to provide a pedestal with adequate space for control personnel, as well as maximum illumination for structure.

The construction problems were especially noteworthy because of the unusually high proportion of steel to concrete — 165 tons of reinforcing steel, supported by Sylgab accessories, in 1,300 yards of concrete.

SYLGAB'S effective layouts for use of bar accessories, and perfectly timed deliveries, coordinated with construction schedules, contributed to the rapid completion of this job.

SYLGAB products offer two major time-saving advantages: they are designed for instant installation; they permit fast pouring due to high rigidity. In addition, our service assures delivery exactly when required.

Phone, Write or Wire For
SYLGAB CATALOG
your most reliable guide to Reinforced Concrete Accessories

Member Concrete Reinforcing Institute

SYLGAB
STEEL & WIRE CORP.
79-05 Cooper Ave., B'klyn 27, N. Y.
EV 6-7806

BEAM CLIPS • SPECIAL COLUMN CLIPS
EXPANSIBLE CLIPS
STRAIGHT AND COIL WIRE
HAIRPIN CLIPS • TOGGLE HANGERS
FORM SPACERS • BAR ACCESSORIES

CIRCLE 265 ON READER SERVICE CARD

READY

TO ROLL

Exacting assembly and alignment by the skilled personnel of Pacific Crane and Rigging Co. put this paper machine on the production line in minimum time.

Responsibility for precision installations of this type have been a P. C. & R. specialty for more than 25 years. For additional information on any of the services listed below, write to:

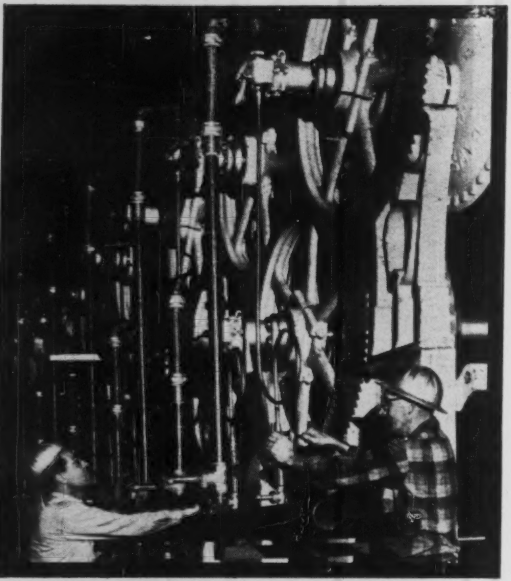
Pacific CRANE & RIGGING CO. MECHANICAL CONSTRUCTORS

PACIFIC CRANE & RIGGING CO.

6855 E. Rosecrans Ave., Paramount, Calif., NEvada 6-9213

POLE RIGGING • MECHANICAL PIPING • CRANE SERVICE • EQUIPMENT SETTING • MISSILE EQUIPMENT • JACK & ROLLER RIGGING • SPECIAL PROJECTS

CIRCLE 52 ON READER SERVICE CARD



NEW

EASY-TO-USE STEEL GRATING CATALOG

SEND NOW FOR YOUR FREE COPY

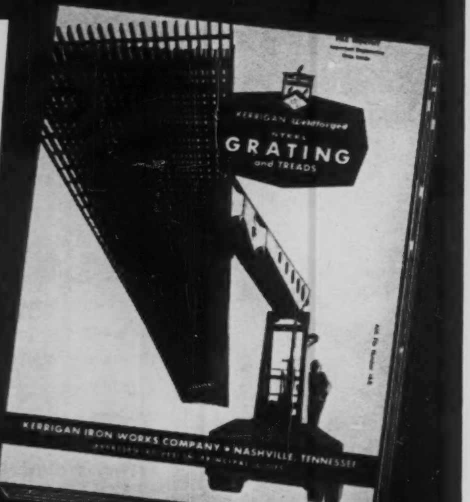
Dept. E-6 KERRIGAN IRON WORKS CO. Nashville, Tenn.

NAME ______

FIRM NAME ______

CITY ______ STATE ______

CIRCLE 266 ON READER SERVICE CARD



Potter-Shackleford Constr. Co, Wa hington Place, Greenville, S. C., CA est. **$300,000**, food distribution PLANT, GREENV.LLE, S. C. Pearce-Young-Angle Co., W. McBee Ave., Greenville, S. C.

S. J. Curry & Co., P. O. Box 1436, Albany, Ga., LB **$506,700**, CHURCH ADDN., ALBANY, GA. First Methodist Church, Flint Ave., Albany, Ga. BA 6/7/61. CD 5/17/61.

▲ **Barge & Co.**, 290 14th St., NW Atlanta, Ga., CA est. **$3,500,000**, 300,000 sq. ft. MOTOR HOTEL, 2050 Piedmont Ave., NE, ATLANTA, GA., Heart of Atlanta Airtel, Inc., C & S Bank Bldg., Atlanta, Ga., John W. Cherry, 1429 Peachtree St., NE Atlanta, Ga., archt. CD 9/11/57.

H. A. Lee, 322 SW 4th Ave., Gainesville, Fla., CA est. **$250,000**. roof deck mfg. PLANT, ARCHER, FLA., Brice Lumber Co., Archer, Fla. Fireproof Products, Inc., Chipewa Falls, Wis. lessee.

Fisherman's Hospital, c/o Smith & Korach, archts., 721 NW 21st Court, Miami, Fla., rejected bids June 1, HOSPITAL, MARATHON, FLA., LB **$796,900**. CD 6/7/61, under LB.

▲ **S. J. Spector & Sons**, 575 SW 22nd Ave., Miami, Fla. Owner Builds, **$2,000,000**, 135,176 sq. ft. two RETAIL STORES, MIAMI, FLA. H. J. Ross & Assocs., 1735 Biscayne Blvd., Miami, Fla., engrs., Consumers Mart of America, lessee.

Clutter Construction Co., 377 Westward Dr., Miami Springs, Fla., LB **$650,000** (5 bidders) Pan American HOSPITAL, N. W. 7th and 60th Ave., MIAMI, FLA. Pan American Hospital Inc., 2230 West Flagler St., Miami, Fla. BA 6/8/61. CD 6/7/61.

Jack Jennings, 1030 Wilfred Dr., Orlando, Fla., LB **$659,400**, HOSPITAL ADDN., SANFORD, FLA., Seminole Memorial Hospital, E. 1st St., Sanford, Fla. BA 6/8/61. CD 6/2/61.

R. S. Thames, Ponce De Leon Road, Ponte Verda Beach, Fla., CA Est. **$700,000**, 100 RESIDENCES, TALLAHASSEE, FLA., George Bull Jr., 321 Atlantic Blvd., Atlantic Beach, Fla.

Hunter Constr. Co., 205 Worth Ave., Palm Beach, Fla. LB **$548,000** (5 bidders) West Palm Beach Public LIBRARY, Narcissus Ave. & Clematis St., WEST PALM BEACH, FLA. City, City Hall, West Palm Beach, Fla Pachner, Robson & Gesbocker, 937 Belvedere Rd., West Palm Beach, Fla. archts. Gee & Jensen, 117½ S. Dixie Hy., West Palm Beach, Fla. engrs.

Edward J. Gerrits, 3465 NW 2nd Ave., Miami, Fla., CA **$640,000**, CLASSROOM, CAFETORIUM and CONVENT, Catholic High School, Spencer Dr. and Sequoic Dr., WEST PALM BEACH, FLA. Diocese of Miami, 6301 Biscayne Blvd., Miami, Fla. BA 6/2/61. CD 5/31/61.

Perry Constr. Co., Box 327, Philadelphia, Miss., CA **$544,591**, Proj. Miss. 30-4, 22 bldgs. 30 units HOUSING and Management Maintenance Bldg.; Proj. Miss. 30-5, 20 bldgs. 30 units HOUSING and Maintenance Bldg., PHILADELPHIA, MISS. Mississippi Regional Housing Auth., City Hall, Philadelphia, Miss. BA 5/11, CA 5/29, CD 6/1/61, under LB.

† **Atlantic Building Co.**, P. O. Box 3345, Charlotte, N. C. LB **$322,300**, COVERED BLEACHERS, Range 31, INV. 01-088-61-19, FORT McCLELLAN, ALA., Purchasing and Contracting Office, Fort McClellan, Ala. CD 7/22/60.

▲ **J & E Warm Co.**, 2335 Florence Ave., Cincinnati, O., CA est. **$3,000,000** design and construct 150,000 sq. ft. concrete block, brick air-conditioned SHOPPING CENTER, Turfway Rd. and Price Park, Boone Co. near here, FLORENCE, KY. Rink's Bargain City, Rte. 4, Hamilton, O.

† **Graybar Electric Co.**, 210 N. Highland Park Ave., Chattanooga, Tenn., CA **$255,000** (6 bidders) WATER SERVICES materials, TURBO GENERATOR, accessories, Paradise Steam Plant, PARADISE, KY. Tennessee Valley Auth., New Sprankles Bldg., Knoxville, Tenn. CA 6/10. CD 3/25/60.

Massengale Constr. Co., 3148 Old Shell Road, Mobile, Ala., LB **$127,679**, WAREHOUSE, MOBILE, ALA. Alabama State Docks Auth., State Docks Bldg., Mobile, Ala. BA 6/6/61. CD 5/26/61.

Flomar & Flinn, 88 South Boulevard, Montgomery, Ala., Owner Builds, **$700,000**, 60,000 sq. ft. DEPARTMENT STORE, MONTGOMERY, ALA. Gaylord's Inc., 306 W. 37th St., New York, N. Y. lessee.

S. J. Lemoine, Box 458, Bunkie, La., LB **$474,000** est. $450,000 (12 bidders), 45,000 sq. ft. steel frame and brick East Beauregard SCHOOL, DE RIDDER, LA. Beauregard Parish School Bd., De Ridder, La. BA 6/6. CD 5/17/61.

▲ **Frank Messer & Sons, Inc.**, 4612 Paddock Rd., Cincinnati 29, O., CA Approx. **$1,000,000**, 14-L-3 REPEATER BLDGS. from Williamstown west to Ohio River, WILLIAMSTOWN, KY. The American Telephone & Telegraph Co., Kroger Bldg., 1014 Vine St., Cincinnati, O. BA 4/16. CD 5/5/61, under LB.

Melson Contractors, Inc., P.O. Box 201, Shelbyville, Tenn., CA **$534,490**, girl's DORMITORY ADDN., Middle Tennessee State College, MURFREESBORO, TENN. State Bd. Educ., Cordell Hull Bldg., Nashville, Tenn. BA 5/25/61. CD 6/2/61, under LB.

Armstrong Constr. Co., 151 Shelby St., Kingsport, Tenn., LB **$552,500**, CITY HALL, KINGSPORT, TENN. City, City Hall, Kingsport, Tenn. BA 6/6/61. CD 5/23/61.

Commercial & Industrial Constr. Co., 1175 Morehead Ave., Memphis, Tenn., CA Est. **$400,000**, DEPARTMENT STORE on Gallatin Pike, NASHVILLE, TENN. Union Realty Co., 1175 Morehead Ave., Memphis, Tenn.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

O., Cleveland—BA 6/29—City, City Hall, Zone 14, W. 3rd ST. RAMP to Exhibition Hall, $160,000. Extended date. Jay R. Katz city engr. CD 11/11/57.

Ill., Knoxville—BA 6/30—Knox County, Courthouse, 24 ft. gravel or crushed stone ROAD surf.; Type A, Proj. 75 and 76-G-MFT. $99,000.

Ill., Mundelein—BA 7/10—Village, Village Hall, SEWAGE TREATMENT PLANT ADDN., $460,000. Consoer, Townsend & Assocs., 360 E. Grand Ave., Chicago Zone 11, engrs. CD 11/15/60.

▲ **O , Cleveland**—BA 7/6—City, City Hall, Zone 14, first phase, EXCAVATION, FOUNDATION WALLS, PILING, DRAINAGE for Mall Exhibition Hall, $1,750,000. Outcalt, Guenther & Van Buren, 13124 Shaker Sq., Cleveland Zone 20, archts. Barber, McGee & Hoffman 1900 Euclid Ave., Cleveland, structural engrs. McGeorge Hargett & Hoag, 7016 Euclid Ave., Cleveland mechanical and electrical engrs. CD 3/14/61, under Public Buildings.

† **Illinois**—BA 7/13—U. S Eng., Clock Tower B'dg., Rock Island, BANK EROSION, PROTECTION POOL No. 18 left bank, Mississippi River near Oquawka, CIVENG-11-117-61-81. Plans deposit $1. CD 5/28/52.

BUILDINGS—BA

▲ **Wis., Menomonee Falls**—BA 7/10—Joint School Dist. No. 6, c/o F. J. Beaudry, Rte. 3, Box 154, general contract, HAMILTON HIGH SCHOOL, Sussex, $2,500,000. Plans deposit $50. Brust & Brust, 1212 W. Wisconsin Ave., Milwaukee, archts. CD 4/13/60.

Wis., Neenah—BA 7/12—Trinity Lutheran Church, E. Franklin Ave., CHURCH, CHAPEL, PARSONAGE, $412,800. Plans deposit $25. Boettcher & Ginnow, Inc., 134 E. Wisconsin Ave., archt. CD 8/7/59.

HEAVY CONSTRUCTION—LB & CA

▲ **OHIO**—State Hy. Dpt., State Depts. Bldg., Columbus, Zone 15, BRIDGES,

V. N. Holderman & Sons Co., 890 Oakland Park Ave., Columbus, O., CA **$2,028,523**, three bridges extending from Underwood St. to east corp. line, constr. one mile Zanesville Expressway, Proj. 280, Muskingum Co. BA 5/23/61. CD 5/26/61, under LB.

† **Eisenman & Elliott**, 37 N. Sylvan Ave., Columbus, O., LB **$584,533**, PRIMARY SPILLWAY, INTAKE WORKS, DISCHARGE CARRIER, TUNNEL and STILLING BASIN for Salt Fork Dam, Guernsey Co., Liberty Twp., U.S. Rte. 21, approx. 6 mi. north of Cambridge, OHIO. Dpt. Natural Resources, Div. Water, 1562 W. 1st Ave., Columbus 12, O. BA 5/23/61. CD 5/4/61.

David Crawley Co., 946 N. Bend Rd., Cincinnati, O., LB **$102,000** (4 bidders), PAVING, sewer-water lines, street of Winton Rd., CINCINNATI, O. Greenfield Development Co., 5240 Lester Rd., Cincinnati, O. Nunlist & Frolicher, 432 Walnut St., Cincinnati, O., engrs.

▲ **M. F. Velotta & Sons, Inc.**, 33141 Bainbridge Rd., Solon, O., LB **$1,326,370**, est. $2,000,000 (3 bidders), North-South TAXIWAY and sewers at Cleveland Hopkins Airport, CLEVELAND, O. City, City Hall, Cleveland 14, O. BA 6/8/61. CD 5/29/61.

C. A. Agresta Constr. Co., 4186 Greenvale Dr., South Euclid 21, O., LB **$703,971**, est. $801,500 (5 bidders), PAVING W. 130th St. from Bagley to Pearl Rd., CLEVELAND, O. Cuyahoga County Comrs., County Administration Bldg., 1219 Ontario, Cleveland 13, O. BA 6/8/61. CD 5/10/61.

Complete General Constr. Co., 1221 E. Fifth Ave., Columbus, O., LB **$742,332**, est. $686,000 (1 bidder), REALIGNMENT TAXIWAY D at Port Columbus Airport, COLUMBUS, O. City, City Hall, Columbus, O. J. E. Greiner Co., 2060 N. James, Columbus, O., engr.

▲† **North East Constr. Co.**, 323 8th St., Parkersburg, W. Va., CA **$3,478,092**, WHERRY HOUSING, Wright Patterson Air Force Base, DAYTON, O. Procurement Officer, Wright Patterson Air Force Base, Dayton, O. BA 4/17/61. CD 5/4/61, under LB.

R. Hansen Co., 2646 N. Moreland Blvd., Cleveland 20, O., LB **$699,900**, est. $500,000 (2 bidders), SWIMMING POOL, SHAKER HEIGHTS, O. City, 3400 Lee Rd., City Hall, Shaker Heights, O. BA 6/9/61. CD 5/31/61.

Heller-Murray Co., 222 W. Rayon St., Youngstown, O., CA **$197,000**, FILTER PLANT ADDN., YOUNGSTOWN, O. Ohio Water Service Co., Struthers, O. Burgess & Niple, 2015 W. Fifth Ave., Columbus, O., engrs. CD 4/14/53.

† **P & H Constr. Co.**, 1157 E. Sycamore St., Evansville, Ind., CA **$166,333**, 1 story, 69 x 98 ft. rein.-con. OPERATION MISSION TRAINING BUILDING ADDN., Bunker Hill Air Force Base, Spec. 31173/61 (REV 4/19/61), PERU, IND. Dist. P. Wks. Office, Ninth Naval Dist., Bldg. 1A, Great Lakes, Ill. BA 5/18/61. CD 5/5/61.

John Dehner, Inc., 1206 Clark St., Fort Wayne, Ind., LB **$422,455**, Spy Run Ave., INTERCEPTOR SEWER, FORT WAYNE, IND. Bd. P. Wks., City Hall, Fort Wayne, Ind. BA 6/9/61. CD 5/18/61.
B. Massa Constr., Inc., 4925 Avondale St., Fort Wayne, Ind., LB **$368,822**, Eby Ave., Brown St. and Hale Ave., SEWER SYSTEM (FORT WAYNE, IND.).

C & C Constr. Co., Inc., 4625 Industrial Bd., Fort Wayne, Ind., LB **$708,124** (2 bidders), two STORM WATER PUMPING STATIONS, Eby, Brown, Hale area, Third St. area, FORT WAYNE, IND. Bd. P. Wks., City Hall, Fort Wayne, Ind. CD 2/4/49.

NEWEST OF THE GREAT NEW MILLER WELDER/POWER PLANTS

AD-225-L
GASOLINE ENGINE-
DRIVEN AC/DC
WELDER/POWER
PLANT

This is as close to being "an all-around hand" as you're ever likely to find. For instance:

A-C or D-C WELDING. The AD-225-L produces 300 amperes at 30 volts a-c or 225 amperes at 30 volts d-c – both at 100% duty cycle. Ample open circuit voltage gives superior results with a-c, d-c or a-c/d-c electrodes.

METALLIC INERT GAS WELDING. Using the d-c side of the AD-225-L, and with new style hand guns feeding small diameter wire from spools, aluminum, mild or stainless steel may be welded by the MIG process. Power for the gun is provided by the 115 volt d-c outlet.

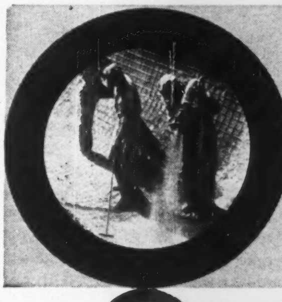
A-C POWER PLANT. As an a-c power plant, this model produces 7 KW of 115/230v single phase 60 cycle current.

AUXILIARY D-C POWER. While welding, the AD-225-L delivers 1 KW of 115v d-c which is ample for operation of flood lights, power tools, etc.

Complete information sent promptly.

miller ELECTRIC MANUFACTURING CO., INC., APPLETON, WISCONSIN
Distributed in Canada by Canadian Liquid Air Co., Ltd., Montreal

CIRCLE 53 ON READER SERVICE CARD



PNEUMATIC CONCRETE CONTRACTORS
specialists in
BUILDING AND REPAIRING CONCRETE CONSTRUCTION
call us for information and bids:

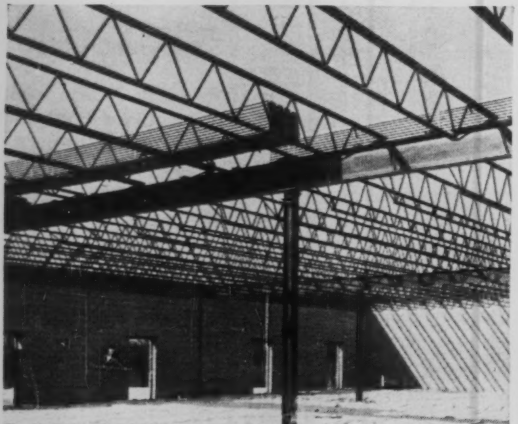
PRE-STRESSED TANKS
RESERVOIR LININGS
PRESSURE GROUTING
PRECIPITATOR LINING
STEEL ENCASEMENT
REFRACTORY LININGS
CONCRETE REPAIRS
STACK & BUNKER LININGS

P P
C R

PENNSYLVANIA PNEUMATIC CONCRETE & REFRACTORIES, INC.
1520 Walnut St., P.O. Box 55, Allentown, Pa.
Area Code 215 HEmlock 3-4168

CIRCLE 267 ON READER SERVICE CARD

Strong, Modern, Dependable



TRUSCON "O-T" OPEN TRUSS® STEEL JOISTS are designed to meet your building requirements. Straight-bottom chord carries to spandrels and columns; end is economically extended. Cold formed steel sections not only make an exceptionally strong joist, but also add a pleasing appearance. In accordance with the Steel Joist Institute, Truscon is making this new joist designed to 20,000 psi working stress. Send coupon for additional information.

REPUBLIC ELECTRUNITE® TUBING in rounds, squares, and rectangles solves many architectural and construction problems. ELECTRUNITE is now produced to specification ST-101 in new larger sizes and a greater range of wall thickness. It offers architects and engineers a building material with virtually unlimited freedom in design. Smooth, unbroken surfaces of ELECTRUNITE without sharp corners or bare edges resist moisture and corrosion. ELECTRUNITE is weldable, easily joined. Write for information.

CIRCLE 268 ON READER SERVICE CARD

SET THE DATE....AND WE'LL DELIVER TRUSCON CONCRETE REINFORCING BARS....ON THE JOB....ON TIME

Fast delivery of Truscon Concrete Reinforcing Bars to your job site can save you time and money in meeting your fast moving schedules. The Truscon Division of Republic Steel has bar fabricating facilities in major building areas. Your order is shipped bundled and properly tagged for quick identification and placing. Rolled from new domestic billets, their properties are recorded from ingot to finished product. No guess work.

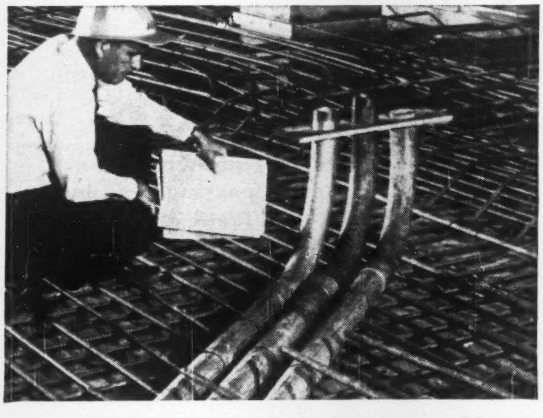
Truscon Re-Bars for concrete slabs, footings, walls, beams, girders, and columns provide positive bond and anchorage. Modern building construction demands the best bars available to develop the high strength of modern concrete. Truscon Re-Bars meet every dependability requirement in helping to support heavy loads.

High strength concrete reinforcing bars meeting ASTM Specifications A-431 (75,000 psi) and A-432 (60,000 psi) are also fabricated by Truscon. Use of these high strength bars can result in lower labor and material costs. And at the same time give you a stronger structure by using their higher design stresses.

When you need the best *fast*, call your Truscon representative, or use the coupon.

REPUBLIC STEEL

REPUBLIC HAS THE FEEL FOR MODERN STEEL



REPUBLIC RIGID STEEL CONDUIT ID AND OD surfaces are fully protected by a hot-dipped galvanized coating which will not peel, flake, or chip off under normal bending. Threads are clean, sharp, free-running. Welds are sound, smooth, strong. Continuous weld process meets severe service requirements and offers highest degree of uniformity and ductility for better fabrication on the job. Call your Republic representative, or send coupon.

REPUBLIC STEEL CORPORATION
DEPT. EN-2383
1441 REPUBLIC BUILDING • CLEVELAND 1, OHIO

Please send more information on the following products:

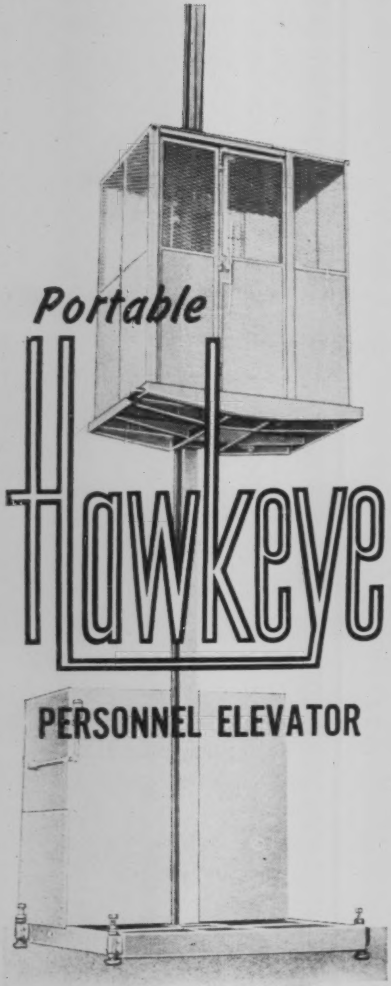
☐ Truscon Concrete Reinforcing Bars
☐ Republic ELECTRUNITE Tubing
☐ Republic Rigid Steel Conduit
☐ Truscon "O-T" Open Truss Steel Joists

Name________________Title__________

Firm__________________________

Address________________________

City______________Zone____State________



Fastest, Safest, Surest
way to the top
for Men and Materials

Now you can have all the time-saving, labor-saving convenience of an elevator PLUS portability and low cost! The Hawkeye moves men and materials safely and surely to the top during construction or in permanent installations for operation and maintenance of production equipment. Your own men can move the portable model Hawkeye to its next point of need quickly and easily. Write today for complete information on the savings and safety that will be yours with Hawkeye!

Hawkeye **PRODUCTS CORP.**
212 Dey Building
Iowa City, Iowa

† **Hardwick Brothers Co.**, First State Bank Bldg., Beardstown, Ill., CA **$349,177**, LIMA LAKE DRAINAGE DIST., Stage II, FLOOD CONTROL PROJECT, left bank Mississippi River, Adams Co., CIVENG-11-117-61-56, ILLINOIS. U. S. Eng., Clock Tower Bldg., Rock Island, Ill. BA 5/9/61. CA 6/5/61. CD 4/6/61.

† **Davis Constr. Co.**, 1231 E. Raines Rd., Memphis, Tenn., CA **$645,250**, placing approx. 175,000 tons 10 in. RIPRAP, upper bank paving on previously graded banks of the Ohio and Mississippi Rivers between Cache River, Ill. (Mile 971 AHP) and Henrico Bar, Ark. (Mile 597 AHP), CIVENG-40-041-61-84, ILLINOIS and ARKANSAS. U. S. Eng., Box 97, Memphis 1, Tenn. BA 5/25/61. CD 4/19/61.

▲ **Economy Plumbing & Heatting Co.**, 7777 Grosse Point Rd., Skokie, Ill., LB **$1,869,000**, est. $1,915,000, Proj 80.85-61-143, UTILITIES TUNNEL, O'Hare Airport, Park Ridge, CHICAGO, ILL. Dpt. Purchases, City Hall, Chicago 2, Ill. BA 6/7/61. CD 6/1/61.

Thomas McQueen Co., 1313 Circle Ave., Forest Park, Ill., LB **$514,023** (11 bidders), Proj. 113-0202-MFT, HY. and RR BRIDGES, East Lake Ave., Glenview, CHICAGO, ILL. Bd. Comrs. Cook Co., County Bldg., Chicago 2, Ill. BA 6/6/61. CD 5/31/61.
W. A. Randolph Co., 6340 Capulina Ave., Morton Grove, Ill., LB **$182,706** (16 bidders), Proj. 113-0202.1-MFT, single span box beam BRIDGE (Chicago, Ill.).

Root Bros. Mfg. & Supply Co., 10307 S. Michigan Ave., Chicago, Ill., CA **$112,044**, Proj. 91-61-2, STREET LIGHTING, CHICAGO, ILL. Dpt. Purchases, City Hall, Chicago 2, Ill. CA 6/5/61. CD 11/10/59.

Lock Joint Pipe Co., 150 Rutledge St., East Orange, N. J., LB **$457,025**, (4 bidders), Proj. 27-61-42, WATERWORKS, incl. precast concrete pipe and fittings, CHICAGO, ILL. City, City Hall, Chicago 2, Ill. BA 5/25/61. CD 5/3/61.

John Doherty Co., 9824 S. Genoa St., Chicago, Ill., LB **$481,933**, est. $650,000 (6 bidders), 174-1516.1A-CF, SEWER, 5,014 ft. 4 x 4.5 ft. to 5.75 x 6.33 ft. RC, CHICAGO, ILL. Cook County Comrs., County Bldg., Chicago 2, Ill. BA 6/6/61. CD 5/25/61.

John Doherty Co., 9824 S. Genoa St., Chicago, Ill., LB **$973,259**, est. $1,096,000 (7 bidders), No. 068-2123-CF, 8,589 ft. 4 x 4 ft. to 5.75 ft. x 6.33 ft., semiellip STORM SEWERS, eleven manholes, 4,200 yd. rock, CHICAGO, ILL. Cook County, Comrs., County Bldg., Chicago 2, Ill. BA 6/6/61. CD 5/17/61.

▲ **Rock Road Constr. Co.**, 5935 N. Rogers, Chicago, Ill., LB **$1,099,956**, est. $1,520,000 (10 bidders), No. 066-1213.1-CF, PAVE South Rte. Expressway, pcc; 18,465 ft. 8 to 24 in. storm sewers, CHICAGO, ILL. Bd. Comrs., Cook Co., County Bldg., Chicago 2, Ill. BA 6/6/61. CD 5/18/61.

Goodwin-McElroy, Mount Zion, Ill., LB $127,962, 106-cs; PAVE N. Taylor St., DECATUR, ILL. City, City Hall, Decatur, Ill. BA 5/22/61. CD 2/17/59.

Gunther Constr. Co., 600 E. Main St., Galesburg, Ill., LB **$126,028**, c. conc. PAVING Academy St., maintenance paving, non-arterial and arterial sts., Proj. 46-1-cs, GALESBURG, ILL. City, City Hall, Galesburg, Ill. BA 5/22/61. CD 4/2/59.

Grange Constr. Co., 2710 E. Norwich St., Milwaukee, Wis., LB **$578,916** (5 bidders), Proj. 93, WATER MAINS, W. Waterford Ave., MILWAUKEE, WIS. City, City Hall, Milwaukee, Wis. BA 6/8/61. CD 5/26/61.

Klug & Smith, Inc., 4425 W. Mitchell St., Milwaukee, Wis., CA **$951,430**, North Point PUMPING STATION, MILWAUKEE, WIS. City, City Hall, Milwaukee, Wis. BA 5/23/61. CD 5/29/61, under LB.

Streets & Road Constr. Corp., 1226 W. Wisconsin Ave., Milwaukee, Wis., LB **$100,842**, PAVING STREETS, SOUTH MILWAUKEE, WIS. City, 2005 10th Ave., South Milwaukee, Wis.

A. Vogt Constr. Co., Inc., 2720 E. Norwich St., Milwaukee, Wis., LB **$120,984** (6 bidders), PAVING W. Beloit Rd. and W. Dakota St., WEST ALLIS, WIS. City, City Hall, West Allis, Wis. CD 2/18/60.

▲ **MICHIGAN**—State Hy. Dpt., 732 Mason Bldg., Lansing 26, ROADS,
Mich.—**L. A. Davidson**, 213 E. St. Joseph, Lansing 33, Mich., CA **$2,372,687**, 5.547 mi. grading, drainage structures, dual concrete pavt., 2 bridges on I-96 (US 16 relocation) from west of Phillips Rd. easterly to west of Meridian Rd., Ingham Co.;

Mich.—**Gilliland Constr. Co.**, 422 Washington Ave., Alpena, Mich., CA **$2,923,693**, 4.64 mi. grading, drainage structures, dual concrete pavt. 7 bridges on I-96, Eaton Co.;

Mich.—**Miller Brothers, Inc.**, Archbald, O., CA **$3,312,288**, 5.7 mi. grading, drainage structures, dual concrete pavt. 6 bridges, US-23, Washtenaw Co. BA 5/24. Grand total $8,608,668. CA 6.6. CD 6/6/61, under LB.

▲ **MICHIGAN**—State Hy. Dpt., 732 Mason Bldg., Lansing 36, BRIDGE,
L. W. Lamb Co., Box 1102, Holland, Mich., CA **$4,996,954**, 8 bridges, retaining walls, grading, drainage structures, dual concrete pavt. US-131 Reloc., Grand Rapids, Kent Co. BA 5/24. CA 6/6. CD 6/6/61, under LB.

BUILDINGS—LB & CA

Colonial Village Gardens, 1203 North Bend Rd., Cincinnati, O., Owner builds **$800,000**, 1 and 2 story APARTMENT, 100 units, air conditioned, swimming pool, south of Langdon Farm Rd., CINCINNATI, O. James Allen, 5555 Glenway Ave., Cincinnati, O., engrs.

CASTINGS?

That's all we make!

And on hand for immediate delivery are thousands of standard designs such as –

What's more, we have

15,000

patterns from which construction castings can be produced fast.

Our 168 page catalog of Gray and Ductile Iron castings will be sent promptly upon request.

NF

NEENAH FOUNDRY COMPANY
NEENAH • WISCONSIN
Chicago office: 5445 N. Neva Ave., Chicago 31

CIRCLE 54 ON READER SERVICE CARD

▲ **Kapel Constr. Co.**, 25000 Euclid Ave., Cleveland, 17, O., Owner builds **$1,200,000**, 30 HOMES, Beverly Hills, EUCLID, O. CD 1/30/61.

▲ **Morris M. Levitt & Assoc.**, 963 Lake Breeze Rd., Lorain, O. Owner Builds. **$1,250,000.** 91 HOMES, Holl Ave., Sheffield Lake, LORAIN, O.

Babcock & Wilcox Co., 2730 Koppers Bldg., Pittsburg, Pa., CA **$327,120,** STEAM GENERATING UNIT with 80,000 lb. boiler at municipal power plant, EAST PALESTINE, O. City, City Hall, East Palestine, O. BA 5/17/61. CD 4/18/61.

Martin Builders, 4562 Warner Road, Cleveland, 5, O., Owner builds **$825,000**, 35 HOMES, Crenshaw Drive, PARMA HEIGHTS, O.

Dunbar Constr. Co., 8201 Cedar Ave., Cleveland, O., CA Est. **$130,000** (6 bidders), 15,000 sq. ft. PLANT for manufacture of hydraulic equipment, Cockran Rd., SOLON, O. Mansfield & Green, 1051 Power Ave., Cleveland 14, O. H. M. Morse & Co., 3334 Prospect Ave., Cleveland 15, O, engrs.

▲ **Iris Constr. Inc.**, 520 Bulkley Bldg., Cleveland, O., Owner Builds. **$1,500,000.** 90 HOMES, Hudson View development, 45-acre site north of Rte. 303, west of Rte. 14, on Walters Rd., STREETSBORO, O. Nathan Bernstein, 1991 Lee Rd., Cleveland, O., archt.

▲ **B & B Constr. Co.**, 1616 Covington, Youngstown, O., CA Est. **$1,000,000,** 70,000 sq. ft. RIDGEVIEW SHOPPING CENTER, 18-acre site at Ridge S.E. near Youngstown S.E. intersection, WARREN, OHIO. Ridgeview Realty, Inc., c/o Victor Natale, 123 High St. N.E., Warren, O.

Sanford Constr. Co., 2193 Green Rd., Cleveland, 21, O., CA **$516,000**, est. $950,000 (9 bidders) Junior High SCHOOL ADDN. and alteration, WICKLIFFE, O. Wickliffe Bd. Educ., 2221 Rockefeller Rd., Wickliffe, O. BA 6/1/61. CD 5/9/61.

▲ **Alex Fodor Realty Co.**, 3308 Lorain Ave., Cleveland, 13, O., Owner Builds, **$1,000,000,** 51 ranch HOMES, 3 mi. east of Youngstown off of Route 422, YOUNGSTOWN, O.

▲ **H. C. Beck Co.**, Fulton National Bank Bldg., Atlanta 3, Ga., CA **$4,545,231**, John W. Foster RESIDENCE CENTER, BLOOMINGTON, IND. Trustees, Admin. Bldg., Indiana University, Bloomington, Ind. Edward D. James, 122 E. Michigan St., Indianapolis, Ind., archt. J. M. Rotz Engineering Co., Inc., 1919 N. Meridian St., Indianapolis, Ind., engr. CD 3/25/59.

Oscar Bohlin & Son, Inc., 3335 Main St., Skokie, Ill., CA **$550,000,** 2 story, rein.-con. DIAL TELEPHONE EXCHANGE, 1022 New York Ave., AURORA, ILL. Illinois Bell Telephone Co., 212 W. Washington St., Chicago, Zone 6, Ill. Holabird & Root, 180 N. Wabash Ave., Chicago, Zone 1, Ill., archts.

Northern Builders, Inc., 4008 W. Addison St., Chicago, Ill., Owner Builds, **$112,400**, 146 x 116 ft. WAREHOUSE, 1121 S. Clinton St., CHICAGO, ILL. Frank S. Musser, 1712 W. 107th St., Chicago, Ill., archt.

William E. Schweitzer & Co., 2207 Dodge Ave., Evanston, Ill., CA **$750,000**, EDUCATIONAL BLDG. and CHAPEL, EVANSTON, ILL. United Presbyterian Church, 1247 Chicago Ave., Evanston, Ill. BA 4/6/61. CD 3/30/61

Mazzucco Constr. Co., 1800 Plainfield Rd., Joliet, Ill. CA **$575,000,** Providence HIGH SCHOOL, U. S. 30, JOLIET, ILL. Joliet Diocese of Catholic Church, 310 Bridge St., Joliet, Ill. CD 6/13/61, under LB.

Mazzucco Constr. Co., 1800 Plainfield Rd., Joliet, Ill., LB **$575,000**, PROVIDENCE HIGH SCHOOL, U.S. 30, JOPPA, ILL. Missouri Portland Cement Co., 3615 310 Bridge St., Joliet, Ill.

▲ **Fruin-Colnon Contracting Co.**, 1706 Olive St., St. Louis 3, Mo., CA $3,000,000 bbl. cement mfg. PLANT incl. single kiln 550 ft. x 14½ x 16½ ft. finish mill, 3,500 hp., raw mill, 3,000 hp. dry process plant with river and rail facilities, quarry at Cave-in-Rock, JOPPA, ILL. Missouri Portland Cement Co., 3615 Olive St., St. Louis 8, Mo. CA 6/2/61.

Lindquist Constr. Co., 206 Brinton Ave., Dixon, Ill., CA **$714,000,** 7 story HOME FOR ELDERLY WING, MOUNT MORRIS, ILL. Church of the Brethren, Mount Morris, Ill. CD 1/28/60.

C. Iber & Sons, 430 E. Fondulas Dr., East Peoria, Ill., LB **$938,800**, general contract, ALTERATIONS, ADDITIONS PEORIA CENTRAL HIGH SCHOOL, PEORIA, ILL. Peoria Public Schools, 3202 Wisc. Ave., Peoria, Ill. BA 5/24/61. CD 11/25/60.

▲ **G. Sjostorm & Sons, Inc.**, 1718 7th St., Rockford, Ill., LB **$1,681,239**, general constr., HOSPITAL ADDN., ROCKFORD, ILL. Swedish-American Hospital, 1316 Charles St., Rockford, Ill. CD 12/1/60, under LB.
Wilson Electric Co., 113 S. Madison, Rockford, Ill., LB **$433,843**, ELECTRIC, finish 2nd, 3rd and 5th floors, enclose 10 stories, for hospital addn. (Rockford, Ill.).
Nelson Piping & Supply Co., 724 6th St., Rockford, Ill., LB **$564,400**, HEATING, VENT. AND AIR CONDITIONING, finish 2nd, 3rd and 5th floors, for Hospital Addn. (Rockford, Ill.).

▲ **F & S Constr. Co.**, P.O. Box 188, Roselle, Ill. Owner Builds. Over **$1,000,000.** 1000 HOME SUBDIVISION, road, sewers, water, etc., mile west of Highland on Butterfield Rd., WHEATON, ILL.

H. F. Campbell Constr. Co., 9301 Michigan St., Detroit, Mich., CA est. **$200,000**, 80 x 218 ft. GARAGE and OFFICES, KENOSHA, WIS. American Motors Corp., 5656 25th Ave., Kenosha, Wis.

▲ **H & H Electric Co., Inc.**, and **Robert J. Nickles, Inc.,** 2704 Royal St., Madison, Wis., CA **$1,309,738,** electric contract for HILL FARMS STATE OFFICE BLDG. A and B, MADISON, WIS. State Public Bldg. Corp., Capitol Bldg., Madison, Wis. BA 4/18/61, CD 5/5/61, under LB.
H. P. H. Assocs., 2030 Pennsylvania Ave., Madison, Wis., CA **$890,000,** heating contract for HILL FARMS STATE OFFICE BLDG A and B (Madison, Wis.).

▲ **J. H. Findorff & Son, Inc.**, 601 W. Wilson St., Madison, Wis., CA **$4,713,907**, HILL FARMS STATE OFFICE, MADISON, WIS. Wisconsin State Public Bldg. Corp., Capitol Bldg., Madison, Wis. BA 4/27/61. CD 5/5/61, under LB.

▲ **Orville Madsen & Son, Inc.**, Sexton Bldg., Minneapolis, Minn., CA **$1,972,892**, MATHEMATICS BLDG., University of Wisconsin, MADISON, WIS. Wisconsin State Agencies Bldg. Corp., Capitol Bldg., Madison, Wis. BA 3/29/61. CD 4/4/61, under LB.

Jezo Constr. Co., 1909 S. 74th St., West Allis, Wis., LB **$445,000** (15 bidders), Madison SCHOOL, WEST ALLIS, WIS. Bd. Educ., 9333 W. Lincoln Ave., West Allis, Wis. BA 5/29/61. CD 5/9/61.

MISSISSIPPI TO ROCKIES

HEAVY CONSTRUCTION—BA

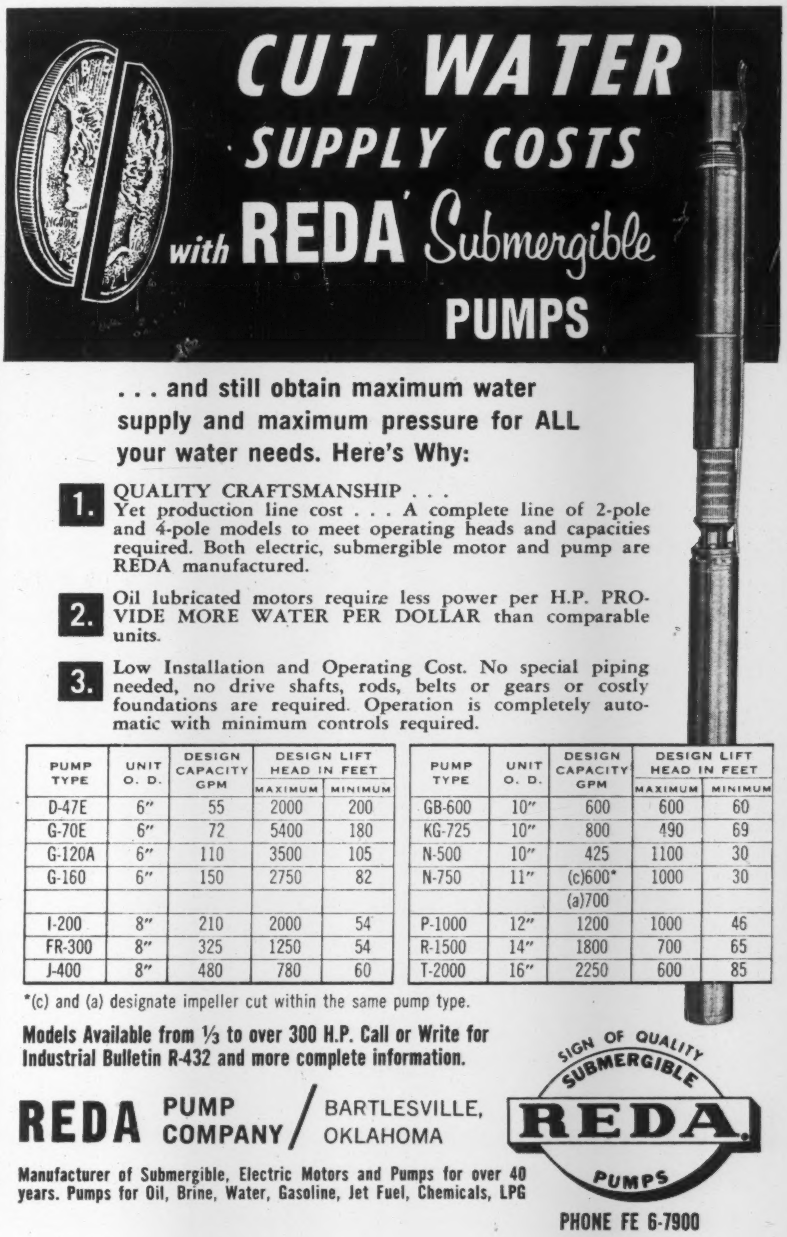
† **Texas**—BA 6/28—U. S. Eng., 606 Santa Fe Bldg., Galveston, CORRECTION OF EARTH SLIDES in Forest Park Cemetery 140 plus 00 to 153 plus 00, Houston, ENG-41-243-61-66, $100,000. Extended date. CD 5/17/61.

Tex., Panhandle—BA 6/27—City, City Hall, asphalt STREET PAVING, $300,000. Plans deposit $25. B. R. McMorries & Associates, Rte. 1, Box 826, Amarillo, engrs.

† **Tex., Kingsville**—BA 6/28—Officer-in-Charge-of-Constr., Bldg. 2705, U. S. Naval Auxiliary Air Station, PAVE PART OF SUPPLY COMPOUND, Naval Auxiliary Air Station, NBy-38661, Spec. No. 38661/61, under $10,000.

Minn., Paynesville—BA 6/29—Village, Village Hall, Part 1, SEWAGE STABILIZATION POND, 220,000 cu. yd. excav.; Part 2, INTERCEPTOR, OUTFALL SEWER, PUMP HOUSE. $340,580. H. A. Kuusisto, 1935 University Ave., St. Paul, Minn., engr. CD 2/9/61.

Minn., Golden Valley (P.O. Minneapolis)—BA 6/30—Village, Village Hall, LATERAL SANITARY SEWER, 17,438 lin. ft. 3 to 13 in. $200,000. D. T. Sorensen, village engr.



CUT WATER SUPPLY COSTS with REDA Submergible PUMPS

. . . and still obtain maximum water supply and maximum pressure for ALL your water needs. Here's Why:

1. QUALITY CRAFTSMANSHIP . . . Yet production line cost . . . A complete line of 2-pole and 4-pole models to meet operating heads and capacities required. Both electric, submergible motor and pump are REDA manufactured.

2. Oil lubricated motors require less power per H.P. PROVIDE MORE WATER PER DOLLAR than comparable units.

3. Low Installation and Operating Cost. No special piping needed, no drive shafts, rods, belts or gears or costly foundations are required. Operation is completely automatic with minimum controls required.

PUMP TYPE	UNIT O. D.	DESIGN CAPACITY GPM	DESIGN LIFT HEAD IN FEET	
			MAXIMUM	MINIMUM
D-47E	6″	55	2000	200
G-70E	6″	72	5400	180
G-120A	6″	110	3500	105
G-160	6″	150	2750	82
I-200	8″	210	2000	54
FR-300	8″	325	1250	54
J-400	8″	480	780	60

PUMP TYPE	UNIT O. D.	DESIGN CAPACITY GPM	DESIGN LIFT HEAD IN FEET	
			MAXIMUM	MINIMUM
GB-600	10″	600	600	60
KG-725	10″	800	490	69
N-500	10″	425	1100	30
N-750	11″	(c)600*	1000	30
		(a)700		
P-1000	12″	1200	1000	46
R-1500	14″	1800	700	65
T-2000	16″	2250	600	85

*(c) and (a) designate impeller cut within the same pump type.

Models Available from ⅓ to over 300 H.P. Call or Write for Industrial Bulletin R-432 and more complete information.

REDA PUMP COMPANY / BARTLESVILLE, OKLAHOMA

SIGN OF QUALITY SUBMERGIBLE REDA PUMPS

Manufacturer of Submergible, Electric Motors and Pumps for over 40 years. Pumps for Oil, Brine, Water, Gasoline, Jet Fuel, Chemicals, LPG

PHONE FE 6-7900

Minn., St. Anthony—BA 7/3—Village, Village Hall, STREET IMPRV. Proj. 1961-1, Sched. A, 4,800 sq. yd. 8 in. concrete paving; Sched. B, 4,000 sq. yd. 6 in. concrete paving; alternate Sched. B, 2,600 lin. ft. 24 in. concrete curb and gutter, etc.; Sched. C, combination Scheds. A, B or alt. B. Extended date. $88,000. Comstock & Davis, Inc., 1446 County Rd. J, Minneapolis 21, Minn., engr. CD 6/7/61.

Minn., Winona—BA 7/5—Winona Co., Courthouse, CSAH 1, CRUSHED ROCK BASE and GRADING 3.2 mi. between CSAH 12, 1.5 mi. east of Nodine and 3.2 mi. southeast. $88,000. G. Fay, co. hy. engr.

Mo., St. Louis County—BA 7/6—Metropolitan St. Louis Sewer Dist., 2000 Hampton Ave., St. Louis, Zone 10, Proj. No. C-86, Section I, Gravois Creek TRUNK SEWER incl. 2 mi. 54 in. sewer line between River des Peres and Mount Olive. Over $800,000. Plans deposit $25. Sverdrup & Parcel & Assocs. Inc., 915 Olive St., St. Louis 1, Mo., engr. CD 4/17/61.

† **Missouri**—BA 7/6—U. S. Eng., Box 97, Tenn., SURFACING, Wappapello Reservoir, Wappapello, CIVENG-40-041-61-103B.

Minn., Baudette—BA 7/6—Village, Village Hall, MUNICIPAL AIRPORT. $146,000. Plans deposit $25. Stewart & Walker, Thief River Falls, Minn., engrs. CD 3/14/60.

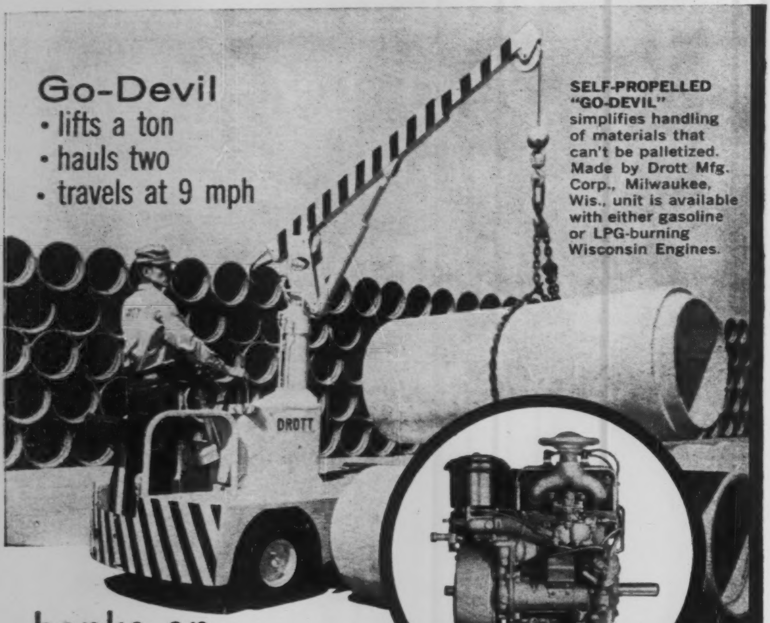
Minn., LeCenter—BA 7/6—LeSueur Co., County Court House, CSAH 11 & 26, CRUSHED ROCK BASE and grading 5.4 mi. between CSAH 32, 2.5 mi north of here and SCAH 28. $88,000. K. Peterson, co. hy. engr.

† **S. D., Rapid City**—BA 7/6—U. S. Eng., 215 N. 17th St., Omaha 2, Neb., RUNWAY ACCESS TAXIWAY, 15,800 sq. yd. pavement removal, 7/500 cu. yd. concrete pavement, base reconditioning, etc., Ellsworth Air Force Base, ENG-25-066-61-179. $300,000. Plans deposit $1. CD 6/8/61.

† **Oklahoma**—BA about 7/13—U. S. Eng., P. O. Box 61, Tulsa, RELOCATION OF OKLAHOMA HY. 99, 1.3 mi. roadway subgrade, incl. the Cimarron River Bridge, three schedules, Cimarron River Section, grading and bridge Keystone Reservoir, Arkansas River, ENG-34-066-61-120, $700,000. CD 9/30/60.

† **Oklahoma**—BA about 7/13—U. S. Eng., P. O. Box 61, Tulsa, RELOCATION OF U. S. HY. 64, surf. 3.2 mi., Cedar Creek Sect., surf. Keystone Reservoir, Arkansas River, ENG-34-066-61-121, $400,000. CD 9/30/60.

Iowa, Center Point—BA 7/14—Town, Town Hall, SANITARY SEWERS, sewage treatment plant, auxiliaries and appurtenances, etc., $275,000. Clapsaddle Engineering Co., Conrad, engr. CD 3/31/61.



SELF-PROPELLED "GO-DEVIL" simplifies handling of materials that can't be palletized. Made by Drott Mfg. Corp., Milwaukee, Wis., unit is available with either gasoline or LPG-burning Wisconsin Engines.

banks on dependability of heavy-duty **WISCONSIN**

Savvy by *Drott* and power by *Wisconsin* enable you to handle irregular objects—and to cut costs with every move of the *Go-Devil.* The unit lifts, telescopes, and swings loads with fingertip ease—hauls them under its own power — and eliminates re-handling.

Drott picked the two-cylinder 18-hp Wisconsin for its *"proven dependability"* in heavy-duty service. The THD provides power for the hydraulically-operated telescopic rotating boom. Its high torque assures safe lifting of heavy objects — and the hauling of two-ton loads up 20% grades without stalling.

The Wisconsin is precision-built for long life and ready availability. Tapered roller main bearings absorb thrusts. Stellite exhaust valves and seats and rotators extend valve life up to 500%! It's air-cooled, so you can count on it in sub-zero cold or 140°F. heat. Servicing is simpler, too.

Keep your materials moving — with equipment powered by heavy-duty Wisconsin Engines, 3 to 56 hp. Get Bulletin S-249. Write Dept. C-11.

WISCONSIN MOTOR CORPORATION
MILWAUKEE 46, WISCONSIN
World's Largest Builders of Heavy-Duty Air-Cooled Engines

M-307

CIRCLE 272 ON READER SERVICE CARD

† **Montana**—BA 7/18—U. S. Eng., 215 N. 17th, Omaha, Zone 2, Neb., 10-in. corrosion resisting steel FLUE for existing FURNACES, Powerhouse No. 1, Fort Peck Dam, CIVENG-25-066-61-143. $25,000. Plans deposit $1. CD 6/8/61.

† **Missouri**—BA 7/25—U. S. Eng., 420 Locust St., St. Louis 2, PUMPS, MOTORS, switchgear and substations, incl. 4 storm water, 4 base flow and 2 sump pumping units, multiple shutter gates for storm water pumping units, etc., St. Louis, CIVENG-23-065-61-92. Over $500,000. CD 6/1/61. under LB.

▲† **S. D., Rapid City**—BA About 7/25—U. S. Eng., Ballistic Missile Contr. Office, 5651 W. 96th St., Los Angeles 45, Calif., 2nd MINUTEMAN COMPLEX, Ellsworth Air Force Base.

BUILDINGS—BA

N. D., Hankinson—BA 6/29—Sisters of St. Francis of the Immaculate Heart of Mary, Hankinson, ACADEMY AND MOTHER HOUSE ADDN., $500,000. F. W. Jackson & Assoc., Inc., 102 3rd Ave. S., St. Cloud, Minn., archt. Orr-Schelen, Inc., 1104 Curris Ave., Minneapolis, Minn., engr. CD 2/10/61.

Colo., Buena Vista—BA 7/11—Colorado State Reformatory, Buena Vista, 1 story ADJUSTMENT and RECEIVING BLDG., **$735,000.** James H. Johnson & Assocs., 7675 W. 14th Ave., Denver, Colo., archts. CD 3/7/61.

▲† **Tex., Fort Sam Houston**—BA 7/13—U. S. Eng., P.O. Box 1229, Galveston, 840 units REMODELING FAMILY HOUSING, Sam Houston Villages, No. 1 and No. 2, ENG-41-243-61-39. $1,500,000. Plans deposit $10. Noonan, Krocker & Rogers, 2002 N. St. Marys St., San Antonio, archts. CD 6/9/61.

† **Tex., El Paso**—BA 7/18—U. S. Eng., P.O. Box 1538, Albuquerque, N. M., REGIMENTAL GYMNASIUM, Fort Bliss, ENG-29-005-61-75, $300,000. CD 9/25/59.

▲ **Colo., Denver**—BA 7/25—Denver United States National Bank, Mile High Center, BANK ADDN. Lincoln St. 15 drive-in windows, $3,000,000. James Sudler Assocs., American National Bank Bldg., Denver, Colo. archts. Carroll S. Delaney, 820 Sherman, Denver, Colo. struct. engr. Francis E. Stark, 1751 Boulder, Denver, Colo. mech. engr. CD 12/9/60.

HEAVY CONSTRUCTION—LB & CA

Sandstrom & Hafner, 2064 St. Anthony Blvd., Minneapolis, Minn., LB **$587,000** (4 bidders) SEWER and WATER IMPRVS. Proj. No. 48, Sched. A, FRIDLEY, MINN. City, City Hall, Fridley, Minn. BA 6/5 (**Correction**—Contractors' name). CD 6/8/61 under LB.

Arcon Constr. Co., Mora, Minn., LB **$163,027** (2 bidders), Contr. B, CONCRETE PAVING and integral curb, EDINA (P. O. MINNEAPOLIS), MINN. Village, Village Hall, Edina, Minn. BA 6/12. CD 6/7/61;

Riegger Roadways, Inc., 900 W. 122 St., Savage, Minn., LB **$134,350** (3 bidders), Contr. A, bit. surf. treatment and concrete curb and gutter (Edina (P. O. Minneapolis), Minn.).

M. J. Jacobs, Bird Island, Minn., CA **$58,892** 12 in. WATER LINES from wells into city, MONTEVIDEO, MINN. City, City Hall, Montevideo, Minn. BA 5/23. CD 5/18/61.

Ebert Plumbing & Heating Co., Alden, Minn., CA **$83,560** iron removal plant, incl. 6x44 ft. concrete block bldg., PRESSURE FILTERS and CHLORINATION EQUIP., WELLS, MINN. Village, Village Hall, Wells, Minn. CD 5/29/61 under LB.

Gjellefald Associates, Forest City, Iowa, CA **$389,565**, Prairie Creek, SANITARY SEWER, CEDAR RAPIDS, IOWA, City, City Hall, **Cedar Rapids, Iowa. CD 9/1/59.**

▲ **Wilson & Taurides, Inc.**, 9302 Ogden Ave., Brookfield, Ill., LB **$1,539,380**, est. $800,000, SEWAGE DISPOSAL WORKS and FACILITIES, MASON CITY, IOWA. City, City Hall, Mason City, Iowa. BA 5/29/61. CD 5/17/61.

Boyer Valley Constr. Co., Inc., Early, Iowa, CA **$96,194** (4 bidders), constr. and maintenance graveling county ROADS, SAC CITY, IOWA. Sac County, Courthouse, Sac City, Iowa.

† **Ideker Constr. Co.**, Mound City, Mo., LB **$103,141** (2 bidders) five WATERSHED PROTECTION and flood prevention structures incl. 4,960 cu. yd. excav., 75,700 cu. yd. earth fill, 1,960 lin. ft. diversion, etc. 102 River Tributaries Watershed, Nodaway Co., MISSOURI. Soil Conservation Dist. of Nodaway Co., Maryville, Mo. BA 6/6. CD 5/18/61.

† **Hughes & Co., Inc.**, Blytheville, Ark., LB **$90,355**, est. $82,850, (3 bidders) MAINTENANCE DOCK SUPPORT, Blytheville Air Force Base, ENG-03-050-61-53, BLYTHEVILLE, ARK., U. S. Eng., P. O. Box 867, Little Rock, Ark. BA 6/1/61. CD 5/25/61.

† **Joseph A. Bass Co.**, 322 Sexton Bldg., Minneapolis 15, Minn., CA **$547,200**, FPS 26 and FPS 27 RADAR TOWERS, Minot Air Force Station, Eng. 25-066-61-147 MINOT, N. D. U. S. Eng., 215 N. 17th St., Omaha 2, Neb. BA 5/26/61. CA 6/7/61. CD 6/2/61 under LB.

R. A. Reighter and R. A. Waxensmith, 6905 West Colfax Ave., Denver 15, Colo., CA **$98,227**, 7 mi. single-pole 69 KV TRANSMISSION LINE, 5 mi. underbuilt work 3 phase dist. line and 2500 Kv substation, Champion, NEBRASKA. Highland Electric Assoc., Holyoke, Colo. Miner & Miner, Consulting Engineers, Inc., 910 27th Ave., Greeley, Colo., engr. BA 4/20/61. CD 11/17/50.

Gerhold Concrete Products Co., 409 Prospect St., Norfolk, Neb., LB **$153,987**, (2 bidders) STREET PAVING, 40 blocks, NORFOLK, NEB. City, City Hall, Norfolk, Neb.

Michaelson Constr. Co., State Hy. 81, Salina, Kan., CA **$449,808**, STREET PAVING, SEWERS, SIDEWALKS, etc., Kay Acres, SALINA, KAN. City, City Hall, Salina, Kan. BA 5/16/61.

† **Husman Brothers, Inc.**, Box 898, Sheridan, Wyo., LB **$86,335**, Missouri River Basin Proj., ROADWAY, STRUCTURES, GRAVEL SURF. 4.15 mi. Fremont Canyon-Pathfinder Dam operating Rd., Proj. 700C 528, WYOMING. Bureau Reclamation, Dpt. Interior, Bldg. 1A, Denver Federal Center, Denver, Colo. BA 5/24/61. CD 4/24/61.

† **Sletten Constr. Co.**, P. O. Box 1188, Great Falls, Mont., CA **$423,392**, STRATEGIC MISSILE SUPPORT AREA FACILITIES, Malmstrom Air Force Base, Phase II, WS 133A, GREAT FALLS, MONT. U. S. Eng., Ballistic Missile Constr. Office, 5651 West 96th St., Los Angelcs, Calif. CD 5/16/61.

Jaybee Constr., Co., 2150 Goodhope, Cape Girardeau, Mo., LB **$105,797**, Contr. IV SEWER SYSTEM incl. seven lift stations and 9,500 lin. ft. c.i. force mains, etc. POPLAR BLUFF, MO. City, City Hall, Poplar Bluff, Mo. BA 6/5.

LeCoutour Constr. Co., 1419 Hampton Ave., St Louis 10, Mo., LB **$403,649** est. $500,000 (11 bidders), two SERVICE BLDGS. One-1 story 81 x 161 ft. and 81 x 120 ft. brick, masonry blocks, steel, concrete, etc.; other 1 story 50' x 240 ft. prefabricated rigid frame steel, service yard fence, paving, drainage, Chain of Rocks Water Works Plant, ST. LOUIS, MO. City, Bd. P. Service, 304 City Hall, St. Louis 3, Mo. BA 6/6. CD 5/9/61.

V & M Contg. Co. Inc., 4030 Chouteau Ave., St. Louis 10, Mo., CA **$786,974** est. $1,095,000 TRANSIT-SHED, WAREHOUSE, OFFICE BLDG. and track work, Municipal Dock foot of North Market St., ST. LOUIS, MO. City, Bd. P. Service, 304 City Hall, St. Louis 3, Mo. BA 5/31, CA 6/6. CD 6/6/61, under LB.

▲† **ASEA Electric, Inc.**, Vasteras, Sweden, LB **$1,547,520** (6 bidders), manufacturing and installing two 56,000 kilowatt GENERATORS, Beaver Dam, Eureka Springs, ENG-03-050-61-66. ARKANSAS, U. S. ENG., P. O. Box 867, Little Rock. BA 6/7/61. CD 5/3/61.

† **W. D. Jeffrey Inc.**, 4201 Towson Ave., Fort Smith, Ark., CA **$939,000**, BANK STABILIZATION, CHANNEL RECTIFICATION, Short Mountain to Wilson's Rock ENG-34-066-61-105 OKLAHOMA U. S. Eng., Box 61, Tulsa 2, Okla. BA About 5/18/61. CD 5/25/61, under LB.

Fraser Constr. Co., 322 S. Ninth St., Fort Smith, Ark., LB **$251,835**, SEWAGE SYSTEM IMPRVS., Schedule B (oxidation ponds) Schedule C (treatment facilities pumping stations) HELENA, ARK., City, City Hall, Helena, Ark., BA 6/6/61. CD 5/24/61.

Moorhead Machy & Boiler Co., 3477 University Ave., N., Minneapolis, Minn, CA **$224,950**, furnish and erect STEAM GENERATING UNIT at State University of Agriculture and Applied Science, FARGO, N. D. State Bd. of Higher Education, Bismarck, N. D. CD 6/5/61, under LB.

† **Hayter Constr. Co.**, 1801 W. Freeway N., Abilene, Tex., LB **$88,880**, est. $85,541 (9 bidders) FLOOD WATER RETARDING STRUCTURES with apprts., Site 24, Jim Ned Creek, SCS-42-TX-61, Coleman, TEXAS. Soil Conservation Service, Dpt. Agriculture, Room 401, First National Bank Bldg., 16-20 Main St., Temple, Tex. BA 6/5/61. CD 5/10/61.

† **Mike Hooks, Inc.**, West Lake, La., LB $357,687, est. $300,000, DREDGING, Laguna Madre & Mud Flat Area, 2,570,000 cu. yds. materials, etc. Intracoastal, Nueces-Kleber-Kenedy Counties, ENG-41-243-61-70, Corpus Christi, TEXAS. U. S. Eng., P. O. Box 1229, Galveston, Tex. BA 6/2/61. CD 5/19/61.

† **Lacon Constr. Co.**, 5630 Yale Blvd., Dallas, Tex., LB **$183,223**, est. $188,345 (7 bidders) FLOOD WATER RETARDING STRUCTURES with appurts., Sites 23, 23 & 26, Clear Creek, SCS-47-GX-61, St. Jo., Montague Co., TEXAS. Soil Conservation Service, Dpt. Agriculture, Room 401, First National Bank Bldg., 16-20 South Main St., Temple, Tex. BA 6/7/61. CD 5/18/61.

† **Leo Jenschke**, Fredericksburg Road, Kerrville, Tex., LB **$106,883**, est. $96,600, EARTHFILL EMBANKMENT FLOODWATER RETARDING STRUCTURE, Proj. No. 6, 8 mi. west San Diego, Duval Co., TEXAS. Nueces County, Comnrs., Court,. Courthouse, Corpus Christi, Tex. BA 6/2/61. CD 5/18/61.

† **Smith Constr. Co.**, Giddings, Tex., LB **$145,094**, est. $159,191 (5 bidders) FLOOD WATER RETARDING STRUCTURES with appts., Sites 5, 6, 7, and 8, Jim Ned Creek, SCS-45-TX-61, Santa Ana, Coleman Co., TEXAS. Soil Conservation Service, Dpt. Agriculture, Room 401, First National Bank Bldg., 16-20 South Main St., Temple, Tex. BA 6/8/61. CD 5/16/61.

† **Bilbig Constr. Co.**, 1801 Proctor, Dallas, Tex., LB **$69,369**, est. $71,966 (12 bidders) FLOOD WATER RETARDING STRUCTURES, Site 50, Clear Creek, SCS-43-TX-61, Sanger, Denton Co., TEXAS. Soil Conservation Service, Dpt. Agriculture, Room 401, First National Bank Bldg., 16-20 South Main St., Temple, Tex. Harold R. Baker, P. O. Box 417, Temple, Tex., engr. BA 6/6/61. CD 5/10/61.

Bowie-Cass Electric Co-operative, Douglasville, Tex., Owner builds, **$175,000**, RURAL ELECTRIC TRANSMISSION LINES, Douglasville, TEXAS. CD 3/18/58.

Groninger & King, Inc., c/o Owners, CA **$620,000**, 31.6 mi., 8, 12 in. CRUDE LINE, Borger to Spearman, TEXAS. Phillips Pipeline Co., Bartlesville, Okla. CD 7/19/56.

NOW

WE'RE SATISFIED!

Despite the temptation to be first in the field, we determined not to offer a two-component Polymer type joint sealer to the industry until we were *completely satisfied with* BONDTITE's *field performance and ease of application.*

Now after critical laboratory testing and careful evaluation of actual performance in airfield and airport installations, we are certain that Servicised BONDTITE which is formulated around an entirely new Polymer, which fully complies with Federal Specification SS-S-00200a, and will outperform any other two component Polymer type joint sealer on the market. In addition, we have developed equipment for the application of BONDTITE which offers the contractor significant advantages in speed, efficiency and economy.

HERE ARE SPECIFIC INSTALLATION AND SERVICE ADVANTAGES OF BONDTITE:

✓ **HIGH INITIAL FLUIDITY . . . SELF-LEVELING IN THE JOINT**—As BONDTITE leaves the applicator nozzle its viscosity is such that it approaches 100% wetting to produce a perfect bond with the full surface of the joint. This free-flowing characteristic makes BONDTITE self-leveling and prevents localized stacking. Upon cure, the material has no flow—even at elevated temperatures.

✓ **COMPLETELY UNAFFECTED BY JET BLAST**—Jet blast and fuel spillage will not affect the bond, stability or cohesion of a cured BONDTITE joint seal.

✓ **GREATER RESILIENCE**—Resilience of cured BONDTITE is such that foreign material temporarily pressed into it will be ejected, once application pressure is removed.

✓ **SLOW RATE OF SET**—Though conforming with the specification, BONDTITE'S relatively slow rate of set provides greater ease of installation, eliminates waste of material due to delays in application.

✓ **CAN BE INSTALLED AND WILL CURE PROPERLY AT LOWER TEMPERATURES**—Flow and cure characteristics imparted by BONDTITE'S new Polymer base permit installation and cure under lower ambient temperatures than any other material meeting the specification.

✓ **FASTER INSTALLATION**—More lineal feet of joint can be sealed per hour because BONDTITE'S smooth, self-leveling flow into the joint permits a higher rate of application.

✓ **50-50 COMPOSITION**—BONDTITE components are mixed 1 to 1 by volume, which simplifies handling in the field, prevents accidental imbalance of mix.

✓ **FINALLY**, equipment for installing BONDTITE is designed to ensure a perfect blend of components—even on re-start. Built for fast, efficient field service, BONDTITE installation units eliminate many of the problems encountered with other equipment. Available under attractive Rental Plan.

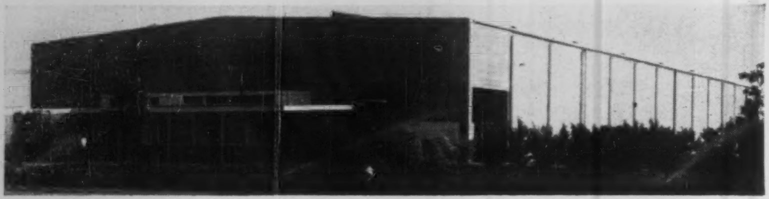
INTERESTED? **Write for a copy of the Robert W. Hunt report on the BONDTITE 400 hour weatherometer test and complete specifications.**

SERVICISED REG. U.S. PAT. OFF. QUALITY PRODUCTS ®

SERVICISED PRODUCTS CORPORATION
6051 W. 65th Street • Chicago 38, Illinois

CIRCLE 273 ON READER SERVICE CARD

Rich Steel Company Warehouse, Los Angeles, Calif., constructed with 24 Rilco glued laminated wood beams, 58' in length. Contractor: Ruane Corp., San Gabriel, Calif. Architect: Joseph L. Johnson, A.I.A., Los Angeles.

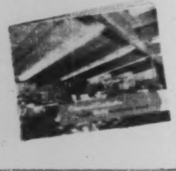


Rich Steel Chooses Wood Beams for Construction and Insurance Savings

"A simple, efficient type of beam, easily erected. We are pleased to recommend Rilco for plant construction," said the contractor about Rilco laminated wood beams used in the Rich Steel Company Warehouse, Los Angeles, California. Added Gustav R. Rich, Rich Steel Company: "We thought the job could be well done with wood beams, and there was an insurance saving of approximately 5 per cent." The architect commented: "Considerably more economical than another type of construction planned."

As these people discovered, Rilco laminated wood structural members cost less to buy, less to erect, less to maintain. Members are erected by regular job crews. Each has a high strength to weight ratio, plus offering the natural beauty and fire resistant qualities of glued laminated wood.

Rilco service engineers will be happy to consult with you on industrial, commercial, church or school buildings. Write for complete information.



Write for free commercial construction catalog.

SEE OUR CATALOG IN SWEET'S

RILCO

works wonders with wood

RILCO LAMINATED PRODUCTS
W801 First National Bank Building
St. Paul 1, Minnesota

DISTRICT OFFICES: TACOMA, WASH. • FORT WAYNE, IND. • NEWARK, N. J.

Raymond C. Murtry, Box 3134, Amarillo, Tex, CA **$133,-180,** HEADQUARTERS AND STORAGE, Dalhart, TEXAS, Rita Blanca Electric Co-operative, Inc., Dalhart, Tex. Brasher & Goyette, 2118-34th. St., Lubbock, Tex., archts.

Shell Pipeline Co., Shell Bldg., Houston, Tex., Owner builds **$135,000,** JUNCTION METERING STATION; **$175,000,** injection PUMP STATION, Quanah, TEXAS. CD 6/1/61.

Trotti & Thompson, Inc., 390 South 4th. St., Beaumont, Tex., CA **$69,000,** ADDNL. EARTHWORK AND DRAINAGE, for plant, ALVIN, TEX. Monsanto Chemical Co., Lindberg St. and Olive St., St. Louis, Mo. CD 1/9/61 under Industrial buildings, under CA.

† **Empire Electric Co.,** 2804 Bledsoe, Fort Worth, Tex., LB **$179,965,** est. $188,907, (9 bidders), APPROACH LIGHTING, Webb Air Force Base, ENG-41-443-61-53, BIG SPRING, TEX. U. S. Eng., 100 West Vickery, Fort Worth, Tex. BA 6/8/61. CD 5/18/61.

Paul Cornett, 1101 N. Reagan St., San Benito, Tex. LB **$94,166** (6 bidders) SANITARY SEWER COLLECTION LINES, Units, 1, 2, 3, Proj. No. 60-144A, BROWNSVILLE, TEX. City, Pub. Utlities Dpt., City Hall, Brownsville, Tex. Sigler, Clark & Associates, 1 mi. E. State Hy., Weslaco, Tex., engrs. BA 5/25/61. CD 11/23/60.

Cecil Rowe, Box 365, Kingsville, Tex., LB **$92,229,** (4 bidders) SANITARY SEWERS, Unit No. 10, Units 1, 2 and s, Proj. No. 60-144A, (Brownsville, Tex.)

Donley County, Claredon, Tex., Owner builds **$138,225,** ROADS repairing, drainage, CLARENDON, TEX.

Heldenfels Brothers, Box 1917, Corpus Christi, Tex., LB **$137,326,** Salt Flats STORM SEWERS, CORPUS CHRISTI, TEX. City, City Hall, Corpus Christi, Tex. CD 2/9/61.

Water Control & Imprvt. Dist., Danbury, Tex., Owner builds **$55,000,** WATER LINES, DANBURY, TEX. CD 5/1/61.

Hidalgo County Road Dist. No. 7, L. F. Boling, c/o Chamber of Commerce, Danna, Tex., Owner builds **$95,500,** ROAD AND STREET DRAINAGE, DONNA, TEX. Joe B. Winston, Mercedes, engr. CD 10/3/60.

Dpt. Pub. Wks., City Hall, Greenville, Tex., Owner builds **$90,000,** STORM SEWERS-OUTFALL LINE, GREENVILLE, TEX. CD 8/26/60;

Dpt. Pub. Wks., City Hall, Greenville Tex., Owner builds **$100,000,** STREET IMPRVTS., GREENVILLE, TEX. CD 8/26/60.

Gulf Bitulithic Co., Box 2572, Houston, Tex., CA **$117,269,** Buffalo Speedway asphalt paving, C & G INSTALL TYPE B INLETS, HOUSTON, TEX. Harris County, Commrs. Court, Courthouse, Houston, Tex. CD 3/16/51.

Menard County Commrs. Court, Courthouse, Menard, Tex., Owner builds **$119,000,** ROAD REPAIRING, drainage, MENARD, TEX.

▲ **M. B. McKee Engineering & Equipment Co.,** 2205 Ave. E., Lubbock, Tex., CA **$1,041,652,** WATER TREATMENT PLANT, ODESSA, TEX. City, City Hall, Odessa, Tex. BA 6/6/61. CD 5/19/61.

City of Richardson, City Hall, Richardson, Tex., Owner builds **$70,009,** WATERLATERALS, RICHARDSON, TEX. CD 11/9/60.

Jones Brothers Dirt & Paving Contr's. Inc., S. Grandview St., Odessa, Tex., LB **$88,118,** ROADS, ODESSA, TEX. Ector County, Courthouse, Odessa, Tex. Kenneth E. Esmond & Associates, 419 W. 5th St., Odessa, Tex., engrs. BA 5/29/61. CD 9/16/58.

City Public Service Board, 145 Navarro St., San Antonio, Tex., Owner Builds **$250,000,** rebuilding obsolete GAS LINES; **$175,000,** installation electric circuits and transformers; **$275,000,** extension electric transmission lines, SAN ANTONIO, TEX. CD 6/4/53.

H. G. Counts Constr. Co., Rankin Hy., Midland, Tex., CA **$237,415,** ASPHALT STREET PAVING, STANTON,TEX. City, City Hall, Stanton, Tex. CD 6/7/61, under LB.

Aubrey Slough Constr. Co., Inc., 2304 Brooklawn Drive, Temple, Tex., LB **$116,580,** est. $225,000, 50 blks. asphalt STREET PAVING, curb and gutter, TEMPLE, TEX. City, City Hall, Temple, Tex. BA 5/29/61.

City of Terrell Hills, 5100 N. New Braunfels Ave., c/o City Hall, San Antonio, Tex., Owner builds **$105,000,** SEWERAGE COLLECTION LINES, TERRELL HILLS, TEX. CD 3/23/60.

City of Terrell Hills, 5100 N. New Braunfels Ave., c/o City Hall, San Antonio, Tex., Owner Builds, **$90,000,** NATURAL GAS LINES, TERRELL HILLS, TEX. CD 3/24/61.

Plymouth Products, Inc., Box 7487, Waco, Tex., LB **$100,329,** SANITARY SEWER EXTENSION, West Waco Industrial Dist., WACO, TEX. City, City Hall, Waco, Tex. CD 12/18/57.

Fitzgerald & Co., Inc., Box 905, Donna, Tex, CA **$107,-138,** CLEARWELL, WESLACO, TEX. City, City Hall, Weslaco, Tex. Sigler, Clark & Winson, Box 428, Weslaco, Tex., engrs.

† **Cordell Const. Co.,** 505 S. Linwood St., Cordell, Okla. LB **$126,866** (9 bidders) four FLOODWATER RETARDING STRUCTURES, Quartermaster Creek, Sites Nos. 4, 5, 10 and 11 Washita River Watershed, Roger Mills Co. OKLAHOMA. Soil Conservation, Dpt., Agriculture, State Office, Stillwater, Okla. BA 6/6/61. CD 5/11/61.

† **Earthmovers, Inc.,** Box 817, Henryetta, Okla., LB **$135,730** (6 bidders) THREE FLOODWATER RETARDING STRUCTURES, Rock Creek, Sites Nos. 11, 12 and 15, Washita River Watershed, Murray Co. OKLAHOMA Soil Conservation Dpt. Agriculture, State Office, Stillwater, Okla. BA 6/8/61. CD 5/17/61.

† **S. E. Evans Inc.**, Box 903 Fort Smith, Ark., CA **$908,525,** RELOCATING STATE HY. No. 99 3.2 mi. Keystone Reservoir, Arkansas River, Eng. 066-61-100 OKLAHOMA, U. S. Eng., Box 60, Tulsa, Okla. BA about 5/10. CD 5/18/61 under LB.

† **Ben Haskins Constr. Co.**, 319 S. Cordell St., Cordell, Okla., LB **$99,331** (9 bidders) three FLOODWATER RETARDING STRUCTURES, Quartermaster Creek, Site Nos. 7, 8 and 9, Washita River Watershed, Roger Mills Co. OKLAHOMA Soil Conservation Service, Dpt. Agriculture State Office, Stillwater, Okla. BA 6/8/61. CD 5/25/61.

C. V. Miller Co., 1260 Simms, Lakewood, Colo., CA **$71,843**, WATER WORKS IMPRVS.; (A) well site No. 1 pumping facilities, (B) distribution system, 750 GPM pump station and chlorination, 10,500 ft. distribution system piping, ANTONITO, COLO. Town, Town Hall, Antonito, Colo. CA 6/1/61. CD 5/29/61.

Quad Constr. Co., 3640 Fenton, Denver, Colo., LB **$101,578**, (6 bidders) WATER SUPPLY DEVELOPMENT, McCullough Syphon and Collection System, Breckenridge, COLORADO SPRINGS, COLO. City, City Hall, Colorado Springs, Colo. BA 6/6/61. CD 5/29/61.

City of Perryton, City Hall, Perryton, Tex., Owner builds **$67,100**, c.i. WATER LINES, PERRYTON, TEX.

City of Richardson, City Hall, Richardson, Tex, Owner builds **$110,000**, SANITARY SEWER LINES, RICHARDSON, TEX. CD 11/9/60.

Lackland Water Control & Imprvt. Dist., 6936 San Pedro Ave., San Antonio, Tex., Owner builds **$82,000**, c.i. WATER LINES, SAN ANTONIO, TEX. R. Marvin Shipman; 202 Olmos Drive West, San Antonio, Tex., engr. CD 10/8/59.

Lackland Water Control & Imprvt. Dist., 6936 San Pedro Ave., San Antonio, Tex., Owner builds **$204,000**, STORM SEWERS and sanitary sewer lines, SAN ANTONIO, TEX. R. Marvin Shipman, 202 Olmos Drive West, San Antonio, Tex., engr. CD 10/8/59.

▲ **Killian-House Co.**, 4600 Broadway Ave., San Antonio, Tex., CA **$2,473,698** (4 bidders) East Lake RESERVOIR, appurtenances, Elmendorf, 17 mi. south, SAN ANTONIO, TEX. City Public Bd., 145 Navarro St., San Antonio, Tex. Brown & Root Engineering, P. O. Box 3, Houston, Tex., engrs. BA 5/19/61. CD 8/22/60.

Bexar County Prec. No. 1, Commrs. Court, Courthouse, San Antonio, Tex., Owner Builds **$125,000**, ROADS, SAN ANTONIO, TEX. CD 11/12/57.

▲ **Wm. A. Smith Constr. Co.**, Box 15227, Houston, Tex., LB **$1,494,287**, est. $1,425,000 (8 bidders), STORM DRAINAGE SYSTEM, mostly 16 ft. rein.-conc. conduit work, WACO, TEX. City, Dpt. Pub. Wks., City Hall, Waco, Tex. BA 6/7/61. CD 5/9/61.

† **Robert L. Guyler**, Box 591, Lampasas, Tex., LB **$722,208** (15 bidders) AIRMEN DORMITORIES remodeling and A/C INV-41- 11-61-54, WACO, TEX. Base Procurement Office, James Connally Air Force Base, Waco, Tex. BA 6/6/61. CD 5/25/61.

City of Waxahachie, City Hall, Waxahachie, Tex., Owner Builds, **$110,000**, replacement, SANITARY SEWER LINES, WAXAHACHIE, TEX. CD 5/9/61.

City of Waxahachie, City Hall, Waxahachie, Tex., Owner Builds, **$100,000**, STREET REPAIRING, WAXAHACHIE, TEX. CD 5/8/61.

▲† **Dan-D Constr., Inc., and D. D. Skousen & Son**, Springer Bldg., Albuquerque, N. M., CA **$1,082,033**, constr. of EARTHWORK and STRUCTURES for Main Canal, Sta. 359 plus 55 to 1476 plus 60, laterals, gravity extension, East Highline and West Highline laterals, Hammond Proj., DC-5588, NEW MEXICO. Bureau of Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo. BA 6/8/61. CD 5/24/61.

† **Standard Heating and Ventilating Co.**, 818 Iron Ave., S. E., Albuquerque, N. M., LB **$216,444** (4 bidders) AIR CONDITIONING and dust-control modifications, to a production bldg. at the South Albuquerque Works, operated for Commission by ACF Industries, Inc., ALBUQUERQUE, N. M. U. S. Atomic Energy Comn., P. O. Box 5400, Albuquerque, N. M. BA 6/6/61. CD 4/24/61.

BUILDINGS—LB & CA

Ringland-Johnson Constr. Co., 202 Jacobson Bldg. ,Clinton, Iowa, CA **$777,079**, HOME FOR AGED, DAVENPORT, IOWA. Kahl Home for the Aged & Infirm, 1101 W. 9th St., Davenport, Iowa. BA 5/26/61. CD 6/8/61, under LB.

Zitterell-Mills, Webster City, Iowa, LB **$486,843**, 1 story, 50,000 sq. ft. SENIOR HIGH SCHOOL, ROCKFORD, IOWA. Rudd-Rockford-Marble Community School Dist., Rochford, Iowa. BA 5/23/61. CD 12/9/60.

Kranz-Ganley Co., 2033 W. Broadway, Minneapolis, Minn., CA **$912,863**, 2 and 3 story ENGINEERING LABORATORY and OFFICE near Hy. 100, 34 Ave. S. (old Shakopee Rd.), BLOOMINGTON (P. O. MINNEAPOLIS), MINN. Control Data Corp., 501 Park Ave., Minneapolis, Minn. BA 5/16 CD 5/23/61 under LB.

Noyes Constr. Co., Pine Hill, Rapid City, S. D., CA **$404,000**, remodel AUDITORIUM and DINING FACILITIES, Fergus Falls State Hospital, FERGUS FALLS, MINN. State Dpt. Admin., 19 State Capitol, St. Paul, Minn. BA 5/18. CD 5/24/61, under LB.

▲ **M. A. Martinson Constr. Co.**, 250 Fremont Ave. N., Minneapolis, Minn., CA **$1,500,000**, 2 story, bsmnt. RESEARCH CENTER ADDN., GOLDEN VALLEY (P.O. MINNEAPOLIS), MINN. General Mills, Inc., 9200 Wayzata Blvd., Minneapolis, Minn. BA 5/3. CD 5/1/61.

NEWS FROM FLINTKOTE:

SPECIALLY DESIGNED PAVING PRODUCTS

For sealing joints,
For surface sealcoating,
For concrete bonding,

ASK FOR FLINTKOTE ENGINEERING DATA SHEETS ON:

M-200: Fast setting, polymer type joint and crack sealer for concrete pavements—cold applied. Offers best resistance to jet aircraft heat and blast operations under wide temperature variations. Meets Interim Fed. Spec. SS-S-00200a.

H-100: Modified polymer type, two-component compound for concrete pavement and structure joints in highway and non-critical airfield areas. Has many advantages over other hot or cold sealers.

FLINTSEAL® (Regular—SS-S-164) and (Jet Fuel Resistant—SS-S-167b): rubber bearing, hot-poured types for durable sealing of joints and cracks to prevent leaking and provide resistance to wear under repeated freeze-thaw cycles. Meet Fed. Spec. for both types.

FLINTAR® (Regular—R-P-00355a) and (Rubberized): Coal tar pitch emulsions for sealcoating and slurry coating bituminous driveways, parking lots, roads, airfield pavements. High resistance to petroleum fuels, oils—extends life of black-top. Meet all specifications.

FLINTCRETE*: Polysulfide/epoxy compounds (grout and binder) for bonding old and new concrete in restoration and repair of pavements and structures, bonding curbs, traffic markers, skid-proofing and many other adhesive requirements. Procedures fully detailed.

*T.M. OF THE FLINTKOTE COMPANY

SEND COUPON BELOW OR WRITE TODAY:

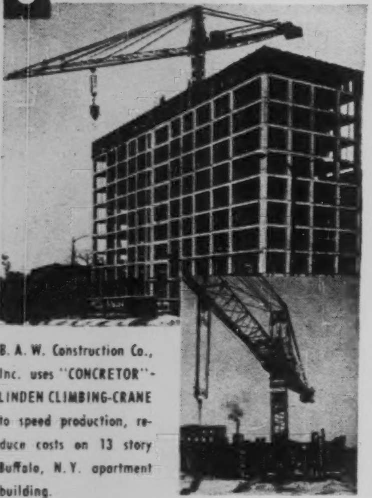
Paving Products Section,
The Flintkote Company,
P.O. Box 157, Whippany, N.Y.

Name____________________
Firm____________________
Address____________________
City__________ Zone____ State____
Please send data on____________________

FLINTKOTE ®

America's Broadest Line of Building Products

CIRCLE 275 ON READER SERVICE CARD



"CONCRETOR"–LINDEN CLIMBING-CRANES BRING COSTS DOWN 6 WAYS!

B. A. W. Construction Co., Inc. uses "CONCRETOR"-LINDEN CLIMBING-CRANE to speed production, reduce costs on 13 story Buffalo, N. Y. apartment building.

1 Speeds production—"Concretor"-Linden Climbing-Crane goes up with the building while work is in progress . . . 2-3 floors at a time . . . the sky's the limit! Raises itself by new patented hydraulic climbing system, with push-button operation. No climbing ropes or pulley blocks.

2 Eliminates rehandling of materials over unnecessary ramps and runways. Unequalled where space is limited because "Concretor"-Linden Climbing-Cranes work from the top. No street access necessary.

3 Places loads where they're wanted! 100' jib rotates in full circle, up to 100' radius. Crane slews, hoists, luffs simultaneously.

4 Remote-controlled by 1 man from working deck. Noiseless—Electrical operation . . . eliminates hazards.

5 Pays for itself in 2 years with ordinary use. Eliminates costly diesel fuel. Almost maintenance-free. Costs about half what you'd expect to pay for earth-bound cranes of similar capacity.

6 Successfully used for demolition—stays on top. Set in a 4' 3" square well in the building—comes down with the job.

Recommended for all types of industrial, apartment and office buildings, silos, water towers, bridges, viaducts, etc.

RENTAL/PURCHASE PLANS. Delivered anywhere in U. S. Factory-trained service engineers available.

For literature address Dept. EN-6

B. M. HEEDE, INC.
30-01 37th Avenue, Long Island City 1, N. Y.
B. M. HEEDE CALIFORNIA, INC.
951 North Linden Ave., South San Francisco, Cal.

▲ **D'Arcy, Leck Constr. Co.**, 2838 Stevens Ave., Minneapolis, Minn., LB **$1,369,980** (B) SCHOOL of BUSINESS ADMINISTRATION BLDG. on West Campus; LB **$1,008,990** (C) GENERAL PURPOSE CLASSROOM BLDG. on West Campus, MINNEAPOLIS, MINN. University of Minnesota, 404 Admin. Bldg., Minneapolis 14, Minn. BA 6/6. CD 5/10/61;
Standard Constr. Co., 212 South 6 St., Minneapolis, Minn., LB **$1,463,600,** (6 bidders), (A) SOCIAL SCIENCE-HUMANITIES BLDG. on West Campus, (Minneapolis, Minn.).

▲ **C. H. Peterson & Co.**, 4020 Minnetonka Blvd., Minneapolis, Minn., LB **$1,167,100,** 4 story, bsmnt., Mens' DORMITORY and DINING FACILITIES, NORTHFIELD, MINN. Carleton College, Northfield, Minn. BA 6/1. CD 5/4/61.

G. I. Johnson & Son Co., 848 W. 79 St., Minneapolis, Minn., CA **$605,000** CHURCH, ST. PAUL, MINN. Maternity of the Blessed Virgin Catholic Church, Dale St. and Arlington Ave., St. Paul, Minn. BA 5/12 CD 5/18/61, under LB.

C. H. Peterson Constr. Co., 4020 Minnetonka Blvd., Minneapolis, Minn., CA **$895,900** Women's and Men's RESIDENCE HALLS (2), ST. PETER, MINN. Gustavus Adolphus College, St. Peter, Minn. BA 5/25 CD 6/2/61 under LB.

▲ **Austin Co.**, 3650 Mayfield St., Cleveland, O., CA Est. **$4,000,000,** design and construct FERTILIZER PLANT, 1 mi. east of jcts. Hys. 52 and 55 near here, PINE BEND (B. O. SOUTH ST. PAUL), MINN. Northwest Cooperative Mills, Inc., 635 Fairview Ave. N., St. Paul, Minn.

▲ **Sheehy Constr. Co.**, 1255 W. Larpenteur Ave., St. Paul, Minn., CA About **$2,000,000** PLANT modernization and alterations, SOUTH ST. PAUL, MINN. Swift & Co., 4115 S. Packers St., Chicago, Ill. BA 5/29. CD 5/17/61.

H. N. Stavn Constr. Co., Hibbing, Minn., LB est. **$250,000** rebuilding WOOD PROCESSING PLANT, VIRGINIA, MINN. State of Minnesota, Iron Range Resources and Rehabilitation Dpt., State Office Bldg., St. Paul, Minn.

Kingery Constr. Co., 1951 Y St., Lincoln, Neb., CA Est. **$400,000,** 2 story, bsmnt., BUS DEPOT, 1st. floor, 50 x 100 ft., 2nd floor, 62 x 124 ft., 10th & P Sts., LINCOLN, NEB. Continental Trailways, 1341 P St., Lincoln, Neb. Harold A. Berry and Steve E. Cook, 3501 Woods Ave., Lincoln, Neb., archts. CD 10/13/60, under Commercial buildings under American Bus Lines.

Arrow Constr. Co., 8129 Delmar Blvd., University City 30, Mo., Owner Builds Total Cost **$800,000** (two years) First Year $500,000, 58 RESIDENCES, Pleasant Grove Subdivision, Clayton and Kehr's Mill Rds., ELLISVILLE, MO.

▲ **Kandle, Iken & Rich Builders**, 701 Candlelight Lake, Olivette 32, Mo., **Eugene Glick**, 107 N.8 St., St. Louis 1, Mo. and **Fred Ahlemeier**, 620-A. N. McKnight Rd., University City, Mo., Owner Builds **$3,500,000,** 11-176 unit RESIDENCES, incl. two-car garage, golf course, etc. Woods Mill and Olive St. Rds., OLIVETTE (ST. LOUIS 32 P.O.), MO. Harlan Bartholomew & Assocs., 317 N.11 St., St. Louis 1, Mo., engrs.

Albers Constr. Co., 5701 Chippewa St., St. Louis 9, Mo., LB **$413,975,** est. $650,000 (4 bidders) CLASSROOM BLDG., School Campus, ROLLA, MO. Curators University of Missouri, Rm. G-1 Parker Hall, School of Mines & Metallurgy, Rolla, Mo. BA 6/6. CD 5/19/61.

Dickie Constr. Co., 317 N.11 St., St. Louis 1, Mo., CA est. **$125,000** SUPERSTRUCTURE, Bulk Loading Bins for cement, 100 block Mott St., ST. LOUIS, MO. Marquette Cement Mfg. Co., 20 N. Wacker Dr., Chicago, Ill. Meissner Engineers Inc., 300 W. Washington St., Chicago, Ill., engr.

G. Dennis, RFD 9, Box 593, Mehlville 29, Mo., CA est. Over **$120,000,** 1 story 129½ x 142 ft. WAREHOUSE and OFFICE, 2100 59 St., ST. LOUIS, MO. Cosmo Guidici, 4940 Pattison Ave., St. Louis 10, Mo. George H. Cika, 8 Kerth Rd., St. Louis 28, Mo., archt. Crescent Parts & Equipment Co., Inc., 825 S. Boyle Ave., lessee.

C & M Constr. Co., 2160 Central Ave., Billings, Mont., CA **$411,200,** two ELEMENTARY SCHOOLS, BILLINGS, MONT. Yellowstone County School Dist. No. 2, 101 10th St., W., Billings, Mont. CD 5/31/61.

† **Texarkana Constr. Co.**, P.O. Box 1079, Texarkana, Tex., CA **$489,499,** 54 unit DORMITORY, for Jones Academy, Indian School, HARTSHORNE, OKLA. Bureau of Indian Affairs, (Post Office Bldg.) Muskogee, Okla. BA 5/18/61.

Income Investment Co., 8020 Forsyth Blvd., Clayton 5, Mo., Owner Builds, **$400,000,** 60 addnl. RESIDENCES, Forest Park Subdivision adjacent to Hy. No. 70, O'FALLON, MO.

Rock Steel Bldg. Co., 2327 W. 7th St., Little Rock, Ark. CA **$136,900,** 1 story, 26,000 sq. ft. garment FACTORY, BERRYVILLE, ARK. Berryville Industrial Development Corp., Berryville, Ark. Lee-Wald Garment Co., 2314 McGee St., Kansas City, Mo. lessee. BA 3/24/61. CD 3/17/61.

Thad Dederick Constr. Co., Box 13067, Houston, Tex., LB **$414,900,** Alice Keith NURSES HOME ANNEX, BEAUMONT, TEX. Baptist Hospital of Southeast Texas, College & 11 Sts., Beumont, Tex. BA 5/23/61. CD 1/3/60.

J. W. Lindsley Co., 2102 Main St., Dallas, Tex., Owner Builds, **$564,500,** SUPERMARKET-SHOPPING CENTER, DUNCANVILLE TEX. CD 2/6/61.

▲ **Bohannon Constr. Co.**, c/o J. W. Bohannon, Jr., 1005 Tarryall St., Dallas, Tex., Owner Builds, **$1,144,000,** 52 DWELLINGS, Country Club Fairways Addn., S. Polk St., Oak Cliff, DALLAS, TEX.

Fred N. Peek, Builders, 6141 Sherry Lane, Dallas, Tex., Owner Builds, **$464,000,** 29 DWELLINGS, Richardson Heights, DALLAS, TEX.

▲ **Johnson, Drake & Piper, Inc.**, P.O. Box 20036, Houston, Tex., CA **$2,194,000,** refrigerated and foods processing PLANT DENISON, TEX. The Pillsbury Co., 314 S. Chandler St., Denison, Tex. BA 5/17/61. CD 5/31/61, under LB.

Associated Contractors of Garland, Garland, Tex., CA **$110,000,** LABORATORY and FABRICATING PLANT, GARLAND, TEX. Unitron, Inc., 1807 Stratford Drive, Garland, Tex.

▲ **Dearborn Stove Co.**, 1700 W. Commerce St., Dallas, Tex., cancelled bids to have been opened June 20, 210,000 sq. ft., masonry PLANT and OFFICE; equipment repair shop, GARLAND, TEX., **$2,150,000.** CD 5/29/61.

Gorbett Brothers Steel, Inc., 27 Industrial Drive, Fort Worth, Tex., CA **$329,800,** 31,400 sq. ft., steel GRAIN STORAGE TANKS, LUBBOCK, TEX. Producers Grain Co., E. 37th. St, Lubbock, Tex. Continental Engineers, Hoke Bldg, Hutchinson, Kan., engrs.

Fred L. Toan, 4134 Travis St., Dallas, Tex, CA **$430,000,** Village SHOPPING CENTER, RICHARDSON, TEX. J. C. Penny Co., 2133 McKinney Ave, Dallas, Tex. Minor & Richardson, 2133 McKinney Ave., Dallas, Tex., archts.

▲ **Centex Constr. Co.**, 4606 Greenville Ave., Dallas, Tex., Owner Builds, **$11,000,000;** ($4,000,000 1st year), two years to complete, 800 DWELLINGS, RICHARDSON, TEX.

▲ **D. J. Rheiner Constr. Co.**, 409 Insurance Bldg., San Antonio, Tex., LB **$1,195,000,** 10 story OFFICE, Cypress St. between Main St. and N. McCullough Ave., SAN ANTONIO, TEX. Morris Kallison, 124 S. Flores St., San Antonio, Tex. BA 5/30/61. CD 5/24/61.

D. W. Marshall Constr. Corp., Box 1879, Victoria, Tex, LB **$880,000** (4 bidders), HIGH SCHOOL and auditorium, WHARTON, TEX. Wharton Ind. School Dist., Wharton, Tex. BA 6/6/61. CD 5/25/61.

FAR WEST

HEAVY CONSTRUCTION—BA

† **Oregon**—BA 6/30—Lane Co. Bd. Co. Comrs., Lane Co. Court House Bldg., Eugene, Q St. FLOODWAY incl. concrete lined channel, six concrete culverts, three drop structures, appurtenant supplemental imprvt. works, Willakensie Area Watershed, Lane Co.

Calif, Los Angeles—BA 7/5—Bd. Supervs. Los Angeles Co., Hall of Records, Zone 12, major ROAD IMPRVTS. Painter Ave. between East Cullen St. and Whittier Blvd., South Whittier.

California—BA 7/6—State Div. Hys., 120 N St., Sacramento, Deadwood CONSERVATION FACILITIES, incl. office, barracks, mess hall, recreation equipment bldgs., warehouse and shop, gas and oil bldgs., Div. of Forestry. W. O. 4420GC-8, Siskiyou Co. $483,000 Plans deposit $50. CD 5/9/60.

Calif., Encinitas—BA 7/6—Olivehaven Municipal Water Dist., Community Hall, Rancho Santa Fe Rd., Unit "D" PIPELINES and PUMP STATION to incl. 17,815 lin. ft. pipe, 1 pump station and reservoir founds, Improvement Dist. No. 2; Water Sys. Unit "E" PIPELINES, 42,420 lin. ft. 6-14 in. cement mortar coated and lined steel pipe, Improvement Dist. No. 3; Water Sys. Unit "F" two-5 m.g. steel RESERVOIR or one-1 m.g. RESERVIOR, Improvement Dists. 1, 2 & 3. Plans deposit $25 each. Boyle Engineering, 4525 Mission Gorge Pl., San Diego 20, Calif., engrs.

† **Wash., Spokane**—BA 7/7—U.S. Eng., 1519 S. Alaskan Way, Seattle, Zone 4, 7,500 sq. ft. masonry CHAPEL, Fairchild Air Force Base (SAC), ENG-45-108-61-181, $400,000. Plans deposit $2.20. CD 7/26/60.

† **Calif., Monterey**—BA 7/7—Dist. P. Wks. Office, 12th Naval Dist., San Bruno, OFFSITE FACILITIES, utilities for 150 units Capehart Quarters, U. S. Naval Postgraduate School. NBy-35878. Spec No. 35878/61. $100,000-$250,000.

▲ **UTAH**—BA 7/7—State Rd. Comn., Utah State Office Bldg., Salt Lake City, Zone 14, ROAD,
Utah Co.—1.671 mi. Interstate Hy. No. 15 from 8th South to 18th South, Salt Lake City. $4,000,000. Plans deposit $20. CD 1/9/61.

Ore., Seaside—BA 7/10—City, City Hall, 21,397 lin. ft. 4 to 12 in. SANITARY SEWERS, Stevens & Thompson, 2234 S. W. 5th. Ave., Portland, engrs. CD 10/18/60.

▲ **Calif., San Diego**—BA 7/11—City, Rm. 161, Civic Center, Zone 1, portion INTERCEPTOR SEWER No. 4. Extended date. $2,806,400. Plans deposit $25. CD 6/6/61.

▲ **Oregon**—BA 7/11—Portland General Electric Co., 721 S. W. Alder St., Portland, 1,740 ft. 21 ft. DIVERSION TUNNEL, Round Butte Dam, Plans deposit $100. Extended date. John Bankus owners engr. CD 3/29/61.

† **Arizona-New Mexico**—BA 7/13—Bureau Reclamation, Dpt. Interior, Page, Ariz., Shiprock 230-kilovolt TRANSMISSION LINE, Coconino, Navajo, and Apache Counties, Ariz., and San Juan Co., N. M., for Glen Canyon Dam, Colorado River Storage Project, Spec. No. DC-5610.

▲ **CALIFORNIA**—BA 7/13—State Div. Hys., 120 S. Spring St., Los Angeles, ROADS,

San Diego Co.—constr. roadway embankment, 2 bridges and connecting roads for future six lane freeway, U. S. Hy. 101 near Del Mar and Carlsbad. $2,984,000. CD 12/5/60.

Ventura Co.—grading, paving to constr. 1 mi. six lane freeway, U. S. Hy. 101 end wid'n. 3.7 mi. State Sign Rte. 23 west of Thousand Oaks for 3.7 mi. $1,490,000. CD 12/5/60.

† **Calif., Sacramento**—BA 7/13—U. S. Eng., 1209 8 St., TEST STAND, JET, Mather Air Force Base. Spec. No. 2753. ENG-04-167-61-45. Plans deposit $2.50. CD 10/29/59.

† **Ore., Mt. Hebo-PUMPHOUSE**—BA 7/13—U. S. Eng., 1519 S. Alaskan Way, Seattle 4, Wash., 17 x 22 ft. rein.-conc. PUMPHOUSE with 64 gpm pumps, small concrete dam 2 mi. 3 in. supply line, access road, for WATER SUPPLY SYSTEM, Mt. Hebo Air Force Station, ENG. 45-108-61-182, $300,000. Plans deposit $3.60. CD 11/7/60.

▲ **Calif., San Diego**—BA 7/19—City, Rm. 161, Civic Center Bldg., Zone 1, INTERCEPTOR SEWER, Contr. No. 5, sewerage collection, disposal and treatment. $1,998,000. Plans deposit $25. CD 11/15/60.

† **Wash., Everett**—BA 7/20—U. S. Eng., 1519 S. Alaskan Way, Seattle Zone 4, furnish, construct pre-engineered steel frame, 430 x 90 x 40 ft. A/C/SHELTER, Paine Air Force Base, ENG. 45-108-61-183, $700,000. Plans deposit $1. CD 7/26/60.

▲ **Calif., San Diego**—BA 8/9—City, Rm. 161, Civic Center Bldg., Zone 1, BULK HANDLING FACILITY, 10th Ave. Marine Terminal. $2,153,000. Plans deposit $25. CD 4/25/55.

▲ **Calif., San Diego**—BA 8/11—City, Rm. 161, Civic Center Bldg., Zone 1, INTERCEPTOR SEWER, Contr. No. 1, sewerage collection, treatment and disposal sys. $5,454,300. Plans deposit $25. CD 11/15/60.

BUILDINGS—BA

† **Oregon**—BA 7/3—U. S. Forest Service, 729 N. E. Oregon St., Portland, 2 RESIDENCES, Sisters Ranger Station, Deschutes Co.

▲ **Calif., Los Angeles**—BA 7/11—Bd. Educ., 1425 S. San Pedro St., Carson HIGH SCHOOL, 22328 S. Main St., Torrance. $4,300,000. CD 4/21/61.

Ore., Ashland—BA 7/12—Bd. Higher Educ., Box 5175, Eugene, 4 story concrete Cascade Hall DORMITORY ADDN. Oregon College of Education. Plans deposit $50. Robert J. Keeney, Medical Center Bldg., Medford, archt. CD 11/27/59.

▲ **Calif., Pomona**—BA 7/12—State Div. Architecture, 107 S. Broadway, Los Angeles, 44,650 sq. ft. AGRICULTURE CLASSROOM BLDG., Kellogg-Voorhis Campus, California State Polytechnic College, W.O. 4414GC-2. $1,115,000. Plans deposit $75. CD 1/10/58.

HEAVY CONSTRUCTION—LB & CA

ALASKA—State Dpt. P. Wks., Juneau, Bids opened 6/1, ROADS,

Alaska—**M-B Contg. Co., Inc.**, Lloyd Bldg., Seattle 1, Wash., LB **$613,410**, est. $437,180 (4 bidders), clearing, grubbing, subsurface explorations 63.672 mi. Palmer-to-Cantwell Hy., Susitna River to Division Creek, Proj. 0, Nos. F-035-2(1)2 (5)3-(1) 3-(2) and 3-(3); LB **$91,635**, est. $68,179 (3 bidders), grading, drainage, 1.208 mi. Eagle River Loop Rd., Proj. SP 1002;

Alaska—**Stock & Grove, Inc.**, Box 2051, Anchorage, Alaska, LB **$336,790**, est. $263,012 (3 bidders), grading, drainage 0.666 mi. Skagway-Carcross Hy., Proj. S-0999(3). CD 5/26/61.

† **Sunset Elec. Co.**, 940 Latouche, Anchorage, Alaska, LB **$96,800**, est. $140,700 (5 bidders), modify ALERT HANGAR, Inv. 61-51, ELMDORF AIR FORCE BASE, ALASKA. U. S. Eng., P.O. Box 7002, Anchorage, Alaska. BA 6/8. CD 5/25/61.

† **Ghemm Co., Inc.**, Box 787, Fairbanks, Alaska, LB **$245,188** (1 bidder), H MARKER and related facilities, FORT YOKON, ALASKA. Federal Aviation Agency, P.O. Box 440, Anchorage, Alaska. CD 10/28/60.

† **Canoro & Birklid**, 747 16, Fairbanks, Alaska, LB **$154,950**, est. $242,168 (7 bidders), remodeling Airmen's DORMITORIES, Murphy Dome Air Force Station, Inc. 61-54, MURPHY DOME, ALASKA. U. S. Eng., P.O. Box 7002, Anchorage, Alaska. BA 6/6. CD 5/18/61.

† **Preimer Gear & Machine Works and H & K Constructors, Inc.**, 1912 Post Rd., Anchorage, Alaska, LB **$736,278**, est. $978,113, (6 bidders), RUNWAY EXTENSION, King Salmon Airport. Inv. 61-31, KING SALMON, ALASKA. U. S. Eng., P.O. Box 7002, Anchorage, Alaska. BA 6/6, CD 5/19/61.

† **Layne Texas Co.**, Box 9098, Houston, Zone 11, Tex., LB **$152,605**, DRILLING TEST HOLES and WATER SUPPLY WELLS, Weber Basin Proj., Ogden, Wasatch Co. Proj. 400C-169, UTAH. Bureau Reclamation, Dpt. Interior, Bldg. 1A, Denver Federal Center, Denver, Colo. BA 6/1/61. CD 5/9/61.

† **Electro Steel Structures, Inc. and Western Erectors Inc.**, P.O. Box 125, Rialto, Calif., CA **$169,921**, GROUND/AIR TRANSMITTER-RECEIVER BLDG., LAS VEGAS, NEV. U. S. Eng., 180 New Montgomery St., San Francisco, Calif. CD 3/22/61, under LB.

IDAHO—Dpt. Hys., 3221 State St., Boise, Bids opened 6/6, ROAD,

Rogers Constr. Co., 11760 NE Glisan, Portland, Ore., LB **$635,847**, (9 bidders), constr. crushed gravel base and plant mix bit. surf., and install guard rail 19.184 mi. Interstate 80N and 15W from Declo Interchange to Raft River, Cassia Co. CD 5/22/61.

Kenaston & Huntley, Lewiston, Idaho, LB **$142,713**, (5 bidders), 500,000 gal. daily TREATMENT PLANT, PUMPING STATION, OROFINO, IDAHO. City, City Hall, Orofino, Idaho. BA 6/5/61. CD 5/25/61.

† **ARIZONA**—Bureau P. Roads, 106 North 5th Ave., Phoenix, Bids opened 6/1, ROADS,

Carl E. Nelson Constr. Co. Inc., 50 E. Tenth St. N. Box 397, Logan, Utah, LB **$410,305**, (2 bidders), North Rim Road improvement, Grand Canyon National Park, Coconino Co. CD 5/25/61.

ARIZONA—State Hy. Dpt., 206 S. 17th Ave., Phoenix, Bids opened 6/9, ROADS,

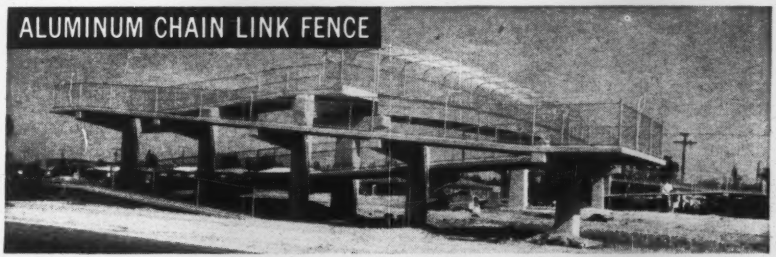
Western Constructors, Inc., P.O. Box 1604 Phoenix, Ariz., LB **$345,378**, est. $334,947 (3 bidders), widening existing roadway, incl. grading, draining, subgrade seal, select material, aggregate base, asphaltic conc. emulsified asphalt seal coat, Proj. NON S 269(1961)B beginning junction of State Rte. 73 and U.S. Rte. 60, Springerville, extending south over State Rte. 73 through town of Eagar approx. 1 2/3 mi., Proj. NON S 291(1961)A beginning south end of Proj. NON S 269(1961)B in town of Eagar, extending south over State Rte. 273 approx. ½ mi., Springerville-Alpine and Eagar School Bus Rte. Hy., Apache Co. CD 5/25/61.

† **Maydwell & Hartzell, Inc.**, 870 Tennessee St., San Francisco, Calif., LB **$334,208** (8 bidders), Schedule 1, 746,000 lin. ft. 1,272 MCM steel reinforced aluminum CONDUCTOR for Glen Canyon-Shiprock Transmission Lines, Colorado River Storage Project DS 5592, ARIZONA. Bureau Reclamation, Dpt. Interior, Bldg. 1A, Denver Federal Center, Denver, Colo. BA 6/6/61. CD 5/15/61.

Maydwell & Hartzell, Inc., 870 Tennessee St., San Francisco, Calif., LB **$113,688** (4 bidders), 13,220 vibration dampers for Glen Canyon-Shiprock 230-kv TRANSMISSION LINE, Colorado River Storage Project DS 5592 (Arizona).

Peter Lametti Constr. Co., N. Scottsdale Rd., Scottsdale, Ariz., CA **$198,890**, install SANITARY SEWERS 16th St., and 24th St. and Buckey Rd. in Phoenix, PHOENIX, ARIZ. City, City Hall, Phoenix, Ariz. CA 6/9/61. CD 6/1/61.

The Kroecker Contracting Co., Inc., 2819 W. Ruthrauff Rd., Tucson, Ariz., LB **$97,944** (4 bidders), GRADING, draining North Swan Road and Sunrise Drive north of Rillito, TUCSON, ARIZ. Pima County Bd. Supervisors, County Bldg., Tucson, Ariz.



Pedestrian overpass, Palmetto Expressway, Miami, Florida.

STEEL CHAIN LINK FENCE
ANCHOR FENCE

Anchor's added values can add to your profit

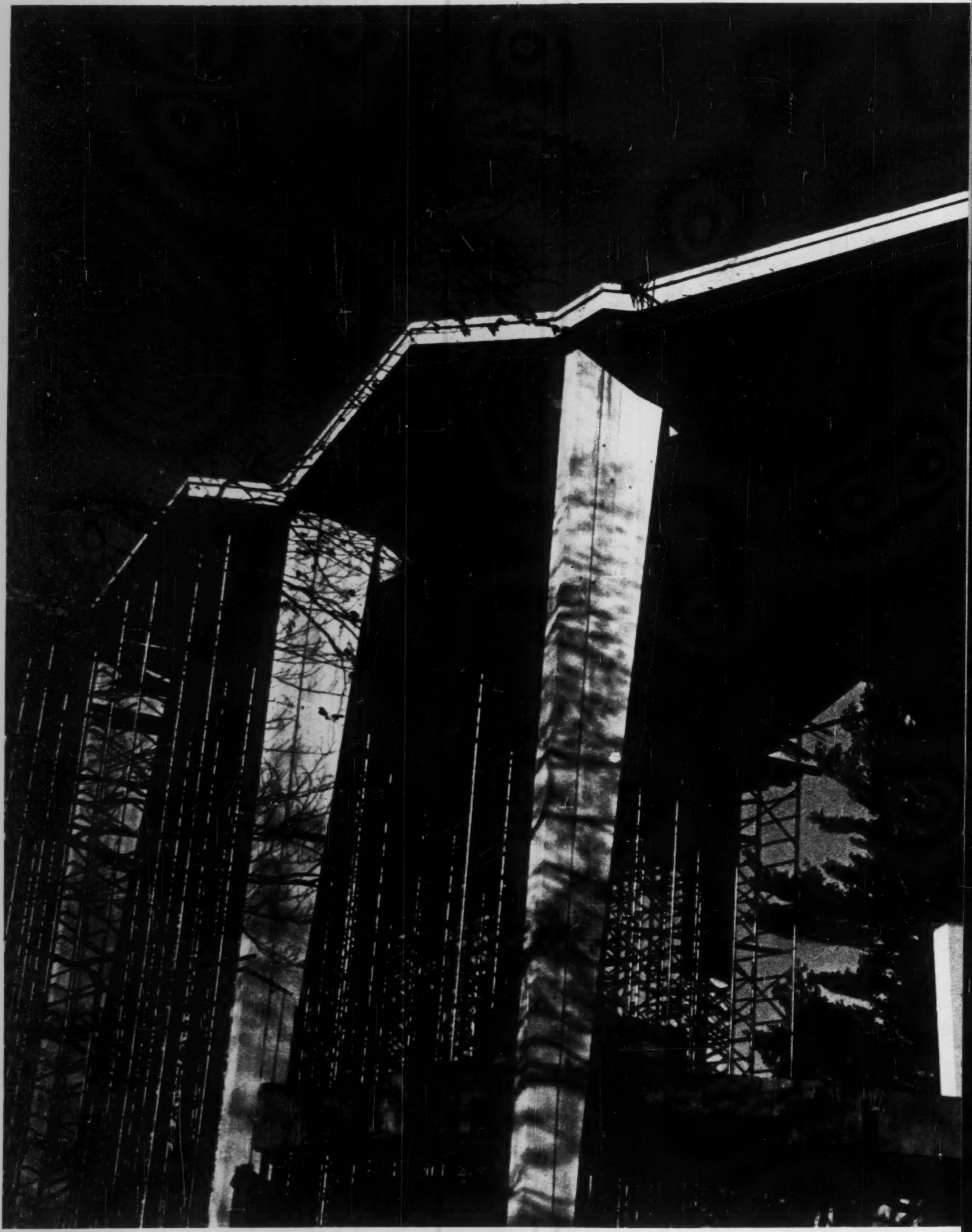
- Technical Assistance
- Experience, Reliability
- Nationwide Service
- Prompt Erecting

How do you choose your subcontractor for fencing and guard rail when the bids are close? Naturally, you look at the intangibles—the *added values* that can make a big difference in your profit on the finished job.

With Anchor, it's a point of pride to be able to offer *more* than just top-quality materials in aluminum or steel. Behind every Anchor bid is over 69 years of experience on jobs in every corner of the country. Anchor maintains 44 regional offices, ready to give you on-the-spot technical help and prompt erecting service. Call the office near you. And, for more data on all Anchor safety devices, write: ANCHOR POST PRODUCTS, 6542 Eastern Avenue, Baltimore 24, Maryland.

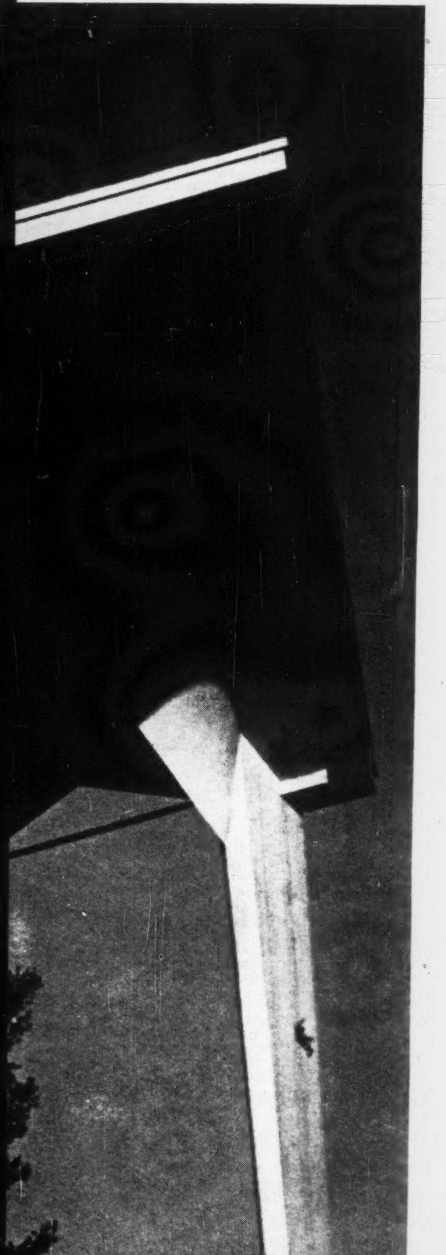
ANCHOR FENCE
Division of ANCHOR POST PRODUCTS, INC.

CIRCLE 277 ON READER SERVICE CARD



St. Mark's Episcopal Church
New Caanan, Conn.

Frank Mercedes & Son, General Contractor
Sherwood, Mills and Smith, Architects



20K heavy duty shoring safely supports huge triangular vault roof

20K FRAMES (each capable of carrying 10,000 lbs. per leg) of "Trouble Saver"® Sectional Steel Shoring are used here to support this complicated 1 ft. to 5 ft.-thick cantilevered concrete roof system of sloping planes and hyperbolic paraboloids. Shoring is quickly erected in free standing, perfectly level and safe units to meet varying heights. Adjustable screw legs are used top and bottom, with U-heads at top to receive stringers. Structure is a 5-bay, 52 ft. by 167 ft. by 50 ft.-high church of modern design.

PS Co. offers complete engineering service through 24 branch offices and warehouses which stock the many types of shoring or scaffolding used when recommending the correct *method* for large jobs or small, complicated or routine. See the Yellow Pages for your nearest source, or write for Shoring Bulletin PSS-51

PSCo SCAFFOLDING & SHORING • SALES • RENTALS

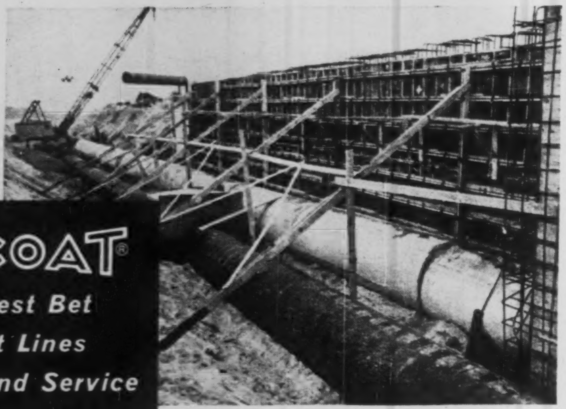
THE PATENT SCAFFOLDING CO., INC.

38-21 12th Street, Dept. ENR, Long Island City 1, New York
1550 Dayton St., Chicago 22 • 6931 Stanford Ave., Los Angeles 1
Branches in all principal cities
IN CANADA: Canadian PS Co., 329 Dufferin St., Toronto

CIRCLE 279 ON READER SERVICE CARD

NO PLACE TO GAMBLE

Joints on steel plant water line are TAPECOATED to provide protection equivalent to coating on the pipe.



TAPECOAT®
is Your Best Bet
to Protect Lines
in Underground Service

You take no chances when you specify TAPECOAT coal tar coating in handy tape form for pipe, pipe joints, fittings, couplings, tanks, tie rods, and conduit on new construction or for maintenance.

Since 1941, TAPECOAT has proved its superiority in resisting moisture, acids, alkalis, and other severe corrosive and abrasive conditions.

TAPECOAT comes in rolls of 2", 3", 4", 6", 18" and 24" widths. It is easy to apply with the use of a torch to bleed the coating which serves as both bond and protection. No skilled help required.

A TAPECOAT sales and service engineer is ready to help you on any corrosion problem. Write for details today.

Originators of Coal Tar Coating in Tape Form

The TAPECOAT Company 1551 Lyons Street, Evanston, Ill.
Representatives in Principal Cities
Manufactured and distributed in Canada by The Tapecoat Company of Canada, Ltd.
25 Haas Road, Rexdale, Ontario

CIRCLE 55 ON READER SERVICE CARD

HORIZONTAL DOORS:
heavy-duty
weathertight

spring-balanced
for easy opening!

Choose Bilco doors to replace those ponderous, old-fashioned floor- and sidewalk-access doors. Bilco spring-balanced doors feature built-in drainage, long trouble-free life.

FREE CATALOG

Tells all you need to know about sidewalk and basement doors, roof scuttles, ceiling doors and flush floor doors; measurements, weights, specification data!

Bilco®

The Bilco Co.,
Dept. EN-6
New Haven, Conn.

HORIZONTAL SPRING-OPERATED DOORS

Arrow Constr. Co., P.O. Box 1272, Yuma, Ariz., LB **$437,756** (2 bidders), Crane ELEMENTARY SCHOOL, YUMA, ARIZ. Yuma County Bd. Supervisors, Yuma, Ariz.

▲ **WASHINGTON**—State Hy. Comn., Dpt. Hys., Olympia, Bids opened 6/6, ROADS,

Wash.—**Thomas Scalz Co.**, 3211 Airport Way S., Seattle, Wash., LB **$807,462,** (6 bidders), clearing, draining grading, placing riprap, surf. bit. surf. treatment, b. conc. paving two rein.-con. slab bridges, two prestressed concrete girder bridges, fencing 4.697 mi. Primary State Hy. 9, Elma to Whites, FA F 010-1(9) Grays Harbor Co.

Wash.—**Goulter Constr. Co.**, 1960 82nd Ave. SE, Mercer Island, Wash., LB **$599,738**, (8 bidders), clearing draining, grading, placing riprap, surf., bit. plant mix paving, fencing 3.736 mi. Primary State Hy. 9, Kennedy Creek to Lynch Rd., FA F 007-5(16) Mason Co.

Wash.—**Base Constr. Co., Inc.**, 12526 Aurora Ave. N, Seattle Wash., LB **$119,434,** (5 bidders), clearing, draining, grading, placing riprap, surf. bit. surf. treatment 0.423 mi. Secondary State Hy. 17-A, concrete vicinity, Skagit Co.

Wash.—**F. R. Hewett Co.**, Box 36, Parkwater Station, Spokane Wash., LB **$320,675**, draining, grading, surf. bit. surf. treatment, b. conc. paving 5.963 mi. Primary State Hy. 7 Davenport south, Proj. FA S 0994(2), Lincoln Co.

Wash.—**Interstate Asphalt Co., Inc.**, Box 1218, Aberdeen, Wash., LB **$109,083,** (3 bidders), surf. bit. surf. treatment, b. conc. paving 6.361 mi. Secondary State Hy. 13-A Stafford Creek to Aberdeen, Grays Harbor Co. CD 5/18/61.

M. Lowe, 1608 Burcham St., Kelso, Wash., LB **$173,108,** (7 bidders), 41,135 ft. 6 to 12 in. conc. SEWERS and 2 to 4 LIFT STATIONS, LONGVIEW, WASH. Beacon Hill Sewer Dist., Beacon Hill Community Hall, Niblett Way, Longview, Wash. BA 6/5/61. CD 5/4/61.

† **U. S. Eng.**, 1519 South Alaskan Way, Seattle, Zone 4, Wash., cancelled bids to have been opened June 13, three STATIONARY LOG BOOMS for Howard A. Hanson Dam, Kanasket, CIVENG-45-108-61-44, WASHINGTON. Est. $50,000. CD 5/25/61.

▲ **WASHINGTON**—State Hy. Comn., Dpt. Hys., Olympia, ROAD,

Thomas Scalzo Co., 3211 Airport Way S., Seattle, Wash., CA **$807,462**, clearing, draining, grading, placing riprap surf. bit. surf. treatment, b. conc. paving, two rein.-conc. slab bridges, two prestressed concrete girder bridges, fencing 4.697 mi. Primary State Hy. 9, Elma to Whites FA F 010-1(9) Grays Harbor Co. BA 6/6/61. CD 6/12/61.

Wash.—**Goulter Constr. Co.**, 1960 82nd Ave. SE, Mercer Island, Wash., CA **$599,738**, clearing, draining, grading, replacing riprap, surf., bit. plant mix paving, fencing 3.736 mi. Primary State Hy. 9, Kennedy Creek to Lynch Rd., FA F 007-5(16), Mason Co.

American Pile Driving Co., ft. of 14th St., Everett, Wash., LB **$318,553**, (3 bidders), 100 ft. EXTENSION, PIER 1 and WAREHOUSE, EVERETT, WASH. Port of Everett, Pier 1, Everett, Wash. BA 6/6/61. CD 5/29/61.

H. Kaeser Co., 3629 34th Ave., S. Seattle, Wash., LB **$596,796**, (5 bidders), 20 to 24 in. concrete cylinder PIPELINE from Judy Reservoir to Mount Vernon, MOUNT VERNON; WASH. Skagit County PUD, 313 Kincaid St., Mount Vernon, Wash. BA 6/8/61. CD 5/25/61;

Snelson P. and H. Co., 506 W. State St., Sedro-Wooley, Wash., LB **$66,945**, (5 bidders), concrete cylinder pipeline from Judy Reservoir to Mount Vernon with intake structure in reservoir, Schedules 2 and 3 (Mount Vernon, Wash.).

† **U. S. Eng.**, 1519 South Alaskan Way, Seattle, Zone 4, Wash., cancelled bids to have been opened June 8, 2 story, 46 x 46 ft. steel frame RADAR TOWER BLDG. on 25 ft. high open steel frame base, Naselle Air Force Base, ENG-45-108-61-163, NASELLE, WASH. Est. $300,000. Will re-advertise. CD 5/2/6

Northwest Constr. Co., 3950 6th Ave., N.W., Seattle, Wash., CA **$865,630,** (3 bidders), earthwork and conc. paving for RUNWAY EXTENSION, Seattle-Tacoma Airport, SEATTLE, WASH. Port of Seattle, Bell St. Terminal, Seattle, Wash. BA 6/6/61. CD 5/25/61.

J. H. Sellen Constr. Co., 228-9th Ave. North, Seattle, Wash., LB **$305,700,** (10 bidders), 36,400 sq. ft. steel frame, rein.-conc. DOMESTIC WORLD OF COMMERCE AND INDUSTRY BLDG., SEATTLE, WASH. Century 21, Exposition Corp., 312 First Ave. North, Seattle, Wash. BA 6/6/61. CD 5/26/61.

▲† **Oregon**—Bureau P. Rds., Morgan Bldg., Portland, ROAD,

J. **N. Conley**, 4332 N.E. Royal Court, Portland, Ore., CA **$1,080,306**, grading, 3 mi., base 9 mi., three structures, Oregon Coast Hy., Lincoln and Tillamook Counties. BA 6/1/61. CA 6/2/61. CD 6/8/61, under LB.

† **Oregon**—Bureau P. Rds., Morgan Bldg., Portland, Bids opened 6/2, ROAD,

Davidson Bros., Amboy, Wash., LB **$404,157** (5 bidders), grading, 2.899 mi., 145 ft. Bridge, Nestucca River Rd., Yamhill and Tillamook Counties. CD 5/18/61.

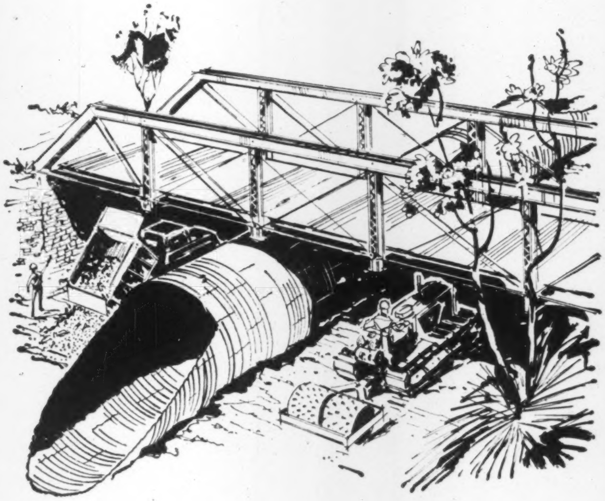
† **OREGON**—U. S. Bureau Indian Affairs, 1002 N.E. Holliday St., Portland, Bids opened 6/8, ROADS,

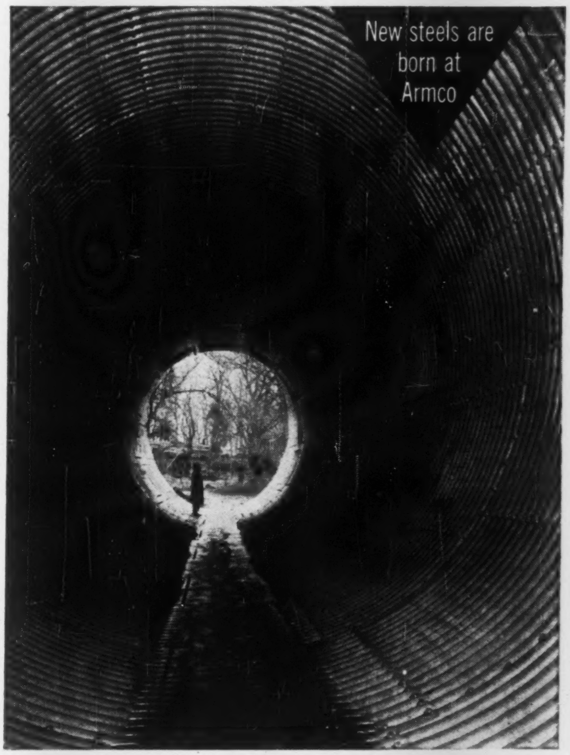
J. **C. Compton**, Box 86, McMinnville, Ore., LB **$180,565** (5 bidders), surfacing 13.883 mi. Warm Springs Reservation.

Collins **Electric Co.**, 611 W. Fremont Ct., Stockton, Calif., LB **$115,327** (4 bidders), POWER LINE, Benton County, OREGON. Consumers Power, Inc., 2100 W. 9th St., Corvallis, Ore.

A NEW IDEA / for Engineers and Contractors

Giant Armco Pipe replaces old bridge




New steels are born at Armco

Corrugated metal drainage structures are now being built **larger** and **lighter** than ever before thought possible. The method, calling for the corrugated metal conduit to act as a compression ring, has evolved from Armco's extensive laboratory research and almost 60 years of field experience. This method **greatly reduces costs:**

In this specific case, an 18-foot diameter, 7 and 10 gage Armco MULTI-PLATE® structure—much lighter than shown in present gage tables—replaced an old country bridge in Ohio.

How was this designed and installed? A full report, presented to the Highway Research Board in Washington, D. C., outlines the methods used. A copy of this report, "The Corrugated Metal Conduit as a Compression Ring," is yours for the asking. Just send in the coupon. **Armco Drainage & Metal Products, Inc., subsidiary of Armco Steel Corporation, 7381 Curtis Street, Middletown, Ohio.**

ARMCO DRAINAGE & METAL PRODUCTS, INC.

☐ Send "The Corrugated Metal Conduit as a Compression Ring."
☐ Send catalog.
☐ Have salesman call.

Name____________________

Street____________________

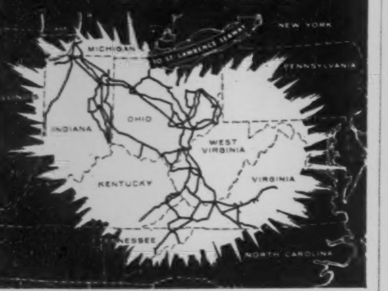
City__________ Zone____ State________

Steel

for strength,
durability,
economy

ARMCO Drainage & Metal Products

ONE-STOP
FREE
"SHOPPING
CENTER"
FOR PLANT
SITES IN
7 STATES



in 2350 communities within the heart of industrial America:

INDIANA · MICHIGAN · OHIO
KENTUCKY · WEST VIRGINIA
VIRGINIA · TENNESSEE

American Electric's "shopping center" furnishes up-to-the-minute information on labor, raw materials, neighboring industries, taxes, water, transportation, recreation, living conditions and all other important factors.

This free service locates the prepared site or available building with the right combination of plant-site factors.

For more information or free brochures, "Power and Natural Resources" and "Plant Location," write or phone, in full confidence, to Mr. Lee L. Davis, Vice President, Area Development, Dept. S622, American Electric Power Service Corp., 2 Broadway, N.Y. 8, N.Y.

AEP

AMERICAN ELECTRIC POWER SYSTEM

An Investor-Owned Public Utility
2 Broadway, New York 8, N.Y.—HA 2-4800

CIRCLE 282 ON READER SERVICE CARD

▲ **CALIFORNIA**—State Div. Hys., 120 South Spring St., Los Angeles, bids opened 6/8, ROADS,

Calif.—**Moulder Bros. and Electro Constr. Corp.**, 122 N. Larchmont Blvd., Los Angeles, Calif., LB **$221,850** (6 bidders) installing median barrier and sign illumination sys. 9.4 mi. San Bernardino Freeway between Puente Ave. in Baldwin Park and Holt Ave., Los Angeles Co.

Calif.—**Oswald Brothers Co.**, 366 East 58 St., Los Angeles, Calif., LB **$653,732**, (6 bidders) wid'n from 4 lanes to 6 lanes Hawthorne Blvd. State Sign Rte. 107 between US Hy. 101 alternate and Manhattan Beach Blvd. 5.7 mi., Los Angeles Co.

Calif.—**B. W. Horn Co.**, 1229 Sandlewood, El Centro, Calif., LB **$184,387** (5 bidders) grading, surf. yard areas and constr. 4 bldgs. for Div. Hys. Maintenance Station about 2 mi. east of Wrightwood, State Sign Rte. 2, Los Angeles Co.

Calif.—**E. L. Yeager Co.**, P.O. Box 87, Riverside, Calif., LB **$138,619** (5 bidders) resurf. State Sign Rte. 111 between Niland and Frink and US Hy. 60-70 between 2.5 mi. and 9.7 mi. east of Hy. 99 Jct., Riverside and Imperial Counties.

Calif.—**Matich Constructors**, P.O. Box 390, Colton, Calif. LB **$102,027** (3 bidders) wid'n 2 to 4 lanes 6.4 mi. southwesterly of Running Springs, San Bernardino Co. CD 5/12/61.

CALIFORNIA—State Div. Hys., 1120 N St., Sacramento, bids opened 6/7, ROADS,

Calif.—**Dicco Inc.**, P.O. Box 217, Station A, Bakersfield, Calif., LB **$110,828**, (4 bidders), resurf. 24 mi. state hy. at various locations, Kern Co.

Calif.—**Clifton B. McCormick**, 40 East Alisal St., Salinas, Calif., LB **$180,655** (7 bidders) grading, surf. yard areas and constr. bldgs. at site of Div. Hys. Maintenance Station near south city limit of Salinas, Monterey Co.

Calif.—**W. D. Foote**, P.O. Box 358, San Gabriel, Calif., LB **$122,263** (4 bidders) grading, surf. yard areas and constr. four bldgs. Div. Hys. Maintenance Station, State Sign Rte. 33 about 1 mi. northwest of Taft, Kern Co. CD 5/12/61.

CALIFORNIA—State Div. Hys., 1120 N St., Sacramento, ROAD,

Ray Kizer and Ray Kizer Constr. Co., 421 S.W. 5 Ave., Portland, Ore. and Castella, Calif., CA **$907,448**, grading, surf. to reconstr. and realign 3 mi. Yreka-Fort Jones Hy. between 9.5 mi. east of Fort Jones and 2.8 mi., west of Yreka, Siskiyou Co. BA 5/24, CA 6/8 CD 6/1/61 under LB.

▲ **CALIFORNIA**—State Div. Hys., 1120 N St., Sacramento, ROAD,

Morrison-Knudsen Co. Ind. and Mercer, Fraser Co., 2nd and Commercial Sts., Eureka, Calif., CA **$1,775,911**, grading, surf to constr. 3.5 mi. 4 lane freeway on US Hy. 101 between 1 mi. south of Eidls Landing and Elk River, Humboldt Co. BA 5/31 CA 6/9 CD 6/2/61 under LB.

▲ **CALIFORNIA**—State Div. Hys., 1120 N St., Sacramento, BRIDGE,

Guy F. Atkinson Co., 10 West Orange Ave., South San Francisco, Calif., CA **$1,537,326**, 13 bridges and grading 4.6 mi. future US Hy. 101 Freeway between Ford Rd. and 0.8 mi. south of Forsythe Creek north of Ukiah, Mendocino Co. BA 5/31 CA 6/9 CD 6/2/61 under LB.

▲ **CALIFORNIA**—State Div. Hys., 120 S. Spring St., Los Angeles, bids opened 6/8, BRIDGE,

Guy F. Atkinson Co., 10 West Orange Ave., South San Francisco, Calif., LB **$3,240,439** (7 bidders) nine bridges on future route of San Diego Freeway between Studebaker Rd. and Cherry Ave in and near Long Beach, Los Angeles Co. CA 5/10/61.

Healy Tibbitts Constr. Co., 411 Brannan St., San Francisco, Calif., LB **$327,200**, (2 bidders), DREDGING and BACKFILLING to provide blanket over Posey Tube on State Hy. Rte. 226 between Oakland and Alameda, Alameda Co., CALIFORNIA. State Div. Hys., 1120 N St., Sacramento, Calif. BA 6/7. CD 5/18/61.

Brown Landscape Co. and the **United Sprinkler Co.**, 15737 Stagg, Van Nuys, Calif., CA **$460,850**, SPORTS CENTER, Sepulveda Dam Park, 80 acre area, vicinity Balboa and Burbank Blvds., LOS ANGELES, CALIF. City Parks & Recreation Dpt., City Hall, Los Angeles, Calif. CD 6/27/57.

▲ **Fruin-Colnon Constr. Co.**, 48 Park Rd., Burlingame, Calif., CA **$1,627,484**, 16 m.g. daily WATER TREATMENT PLANT, SACRAMENTO, CALIF. City Council, City Hall, 9 and I Sts., Sacramento, Calif. BA 5/25. CA 6/8. CD 5/31/61, under LB.

M. G. M. Constr. Co., P.O. Box 1056, Concord, Calif., CA **$336,936**, Vaca Valley PIPELINES, Div. III near here, VACAVILLE, CALIF. Solano Irrigation Dist., P.O. Box 536, Elmira Rd., Vacaville, Calif. BA 5/23. CD 5/8/61.

▲ **CALIFORNIA**—State Div. Hys., 120 S. Spring St., Los Angeles, ROAD,

Gibbons & Reed Co., 825 West 9 North St., Salt Lake City, Utah, CA **$1,274,437**, grading, surf. 2.9 mi. 4-lane freeway on US Hy. 91-466 between 3 mi. east of Barstow and Daggett-Yermo Rd., San Bernardino Co. BA 5/25. CD 6/1/61, under LB.

† **A. T. Smith & Sons, Inc.**, P.O. Box 961, Lompoc, Calif., CA **$280,550**, WS-133A, Phase III, El Rancho Rd. IMPRVT. and OVERPASS, Point Sal area, CALIFORNIA. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif.

▲ **CALIFORNIA**—State Div. Hys., 120 S. Spring St., ROAD,

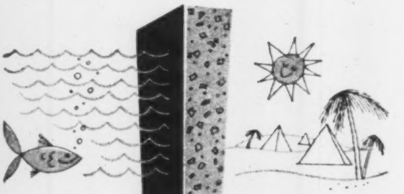
Los Angeles, rejected bids May 11, grading, paving 2.4 mi. six and eight lane freeway on Golden State Freeway between 0.1 mi. west of Lankershim Blvd. and Osborne St. in Los Angeles incl. 15 structures, Los Angeles Co. LB **$3,861,104**. CD 5/16/61, under LB.

2 basic waterproofing needs

① *reliable product*

Men who write waterproofing specifications insist upon *proved* products which they know will uphold their reputations. When they specify IRONITE® WATERPROOFING, a metallic water resistant compound, they know that:

- IRONITE WATERPROOFING is not merely an outer coating
- Its fine particles are carried in suspension in water and thus actually work their way into any and all voids or cavities in the concrete, brick or other porous surfaces
- These particles then oxidize and expand to become a part of the mass to which the IRONITE WATERPROOFING is applied
- Cannot scale, blister, crack or peel
- IRONITE WATERPROOFING cannot be removed without the destruction of the underlying surface
- It has proved its ability to stand up indefinitely in some of the world's most famous buildings



② *reliable application*

Experienced specifiers know that SKILLED APPLICATION is just as important as product competence!

IRONITE WATERPROOFING has been outstandingly successful in all types of industrial, commercial and institutional buildings for more than 50 years because it is applied *by licensed contractors & engineers* who are specialists in the solution of all types of waterproofing problems.

Send for details and information regarding the location of your nearest IRONITE *licensee. Write IRONITE COMPANY, Suite 729—208 South LaSalle St., Chicago 4, Ill.*

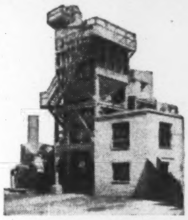
IRONITE COMPANY

® Registered Trademark

CIRCLE 56 ON READER SERVICE CARD

POSEY

IROQUOIS
ASPHALT
PLANTS



Complete
batch type
Asphalt plants with capacities from 50 to 240 tons per hour — hot-cold mix. New automated design enables complete plant to be operated by one man.

For FREE 22-page illustrated catalog, write:

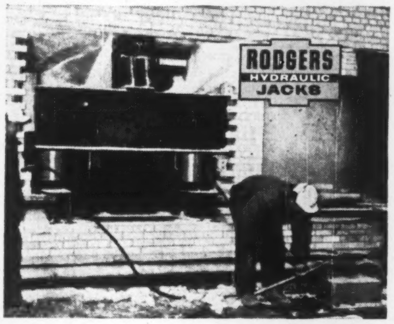
POSEY
IRON WORKS INC

Custom Fabrication
For Over 50 Years

DIVISIONS:
- Iroquois Asphalt Plants
- Mixers and Blenders
- Tunnel Forms
- Industrial Heating
- Foundry
- Large OD Steel pipe

561 S. PRINCE STREET LANCASTER, PA.

CIRCLE 59 ON READER SERVICE CARD



BRUTE FORCE!

Here, a pair of RODGERS hydraulic jacks are used to support the weight of a 16-story building. You can use this same brute force to push culvert, pipe, or casings . . . set concrete decking . . . support overhead forms . . . raise bridges or buildings . . . in fact, for *any* job that requires heavy lifting, pressing, pushing, or pulling. Result: You save time, cut costs. Capacities to 600 tons, hand-pump operated or power driven. Get full details *now*. J-104D

RODGERS HYDRAULIC, INC.
Pioneer in high-pressure Hydraulics, since 1932
7401 Walker St. • Minneapolis 26, Minnesota

CIRCLE 60 ON READER SERVICE CARD

▲ **R. A. Wattson Co.**, Box 679, North Hollywood, Calif., LB **$1,584,867**, est. $1,335,000, (4 bidders), LEVEE FACING and invert for Ballona Creek, Pacific Ave. to Centinela to LaSalle Ave., Culvert City and Los Angeles, LOS ANGELES, CALIF. Los Angeles County Flood Control Dist., 2250 Alcazar St., Los Angeles, Calif. B3 6/9. CD 5/9/61.

▲ **Guy F. Atkinson Co.**, Box 259, Long Beach, Calif., CA **$2,579,511** Items 1, 3A & 4A, open concrete WHARF, Berths 51 through 55, Outer Harbor District, San Pedro Proj. 1429, LOS ANGELES, CALIF Los Angeles Harbor Dpt., Branch City Hall, San Pedro, Calif. BA 6/5 CA 6/7 CD 6/9/61 under LB.

▲ **Kemper Constr. Co.**, 3701 Overland Ave., Los Angeles, Calif., CA **$1,419,494** est. $2,000,000, 7,000 ft. 96 in. WATER TRANSMISSION TUNNEL, Santa Susana Mountains, Chatsworth, SOMIS, CALIF. Colleguas Municipal Water Dist., Box 183, Somis, Calif. BA 4/19 CA 6/7 CD 4/25/61 under LB.

BUILDINGS—LB & CA

▲ **Robert E. McKee, Contractor**, 1918 Texas St., El Paso, Tex., LB **$1,416,200**, (2 bidders), gym, industrial arts bldg. and heating and cooling plant, East Side's Palo Verde High School, TUCSON, ARIZ. Bd. Supervisors, Pima Co., County Bldg., Tucson, Ariz.

▲ **G. Kirkebo & Son Inc.**, 7202 South 35th St., Tacoma, Wash., CA **$1,393,006**, general contract, HIGH SCHOOL, TACOMA, WASH. Clover Park School Dist. 400, 5214 Steilacoom Blvd. S.W., Tacoma, Wash. BA 5/25/61. CD 5/31/61 under LB;
Pease & Sons, Box 2037, Tacoma, Wash., CA **$575,689**, mechanical contract, HIGH SCHOOL, (Tacoma, Wash.).

▲ **Crown Constr. Co.**, 5059 W. Pico Blvd., Los Angeles, Calif., LB **$2,688,659** est. $2,700,000 (5 bidders) Alfred Nobel JUNIOR HIGH SCHOOL, Granada Hills, LOS ANGELES, CALIF. Bd. Educ., 1425 S. San Pedro St., Los Angeles, Calif. BA 6/7 CD 5/23/61.

▲ **Swinerton & Walberg Co.**, 1723 Webster St., Oakland, Calif., CA est. **$2,000,000**, SERVICE CENTER, Nimitz Freeway near High St., OAKLAND, CALIF. Pacific Gas & Electric Co., 245 Market St., San Francisco 6, Calif. CA 6/8. CD 4/28/61.

Eichler Homes Inc., 2151 St. Francis Dr., Palo Alto, Calif., Owner Builds, **$527,000**, 34 frame DWELLINGS, Tract 3978, ORANGE, CALIF.

Maxcobe Homes Inc., 313 W. Walnut, Orange, Calif., Owner Builds, **$459,000**, 34 stucco DWELLINGS, 1233-1602 E. Chestnut, Tract 3954, ORANGE, CALIF.

Wm. H. Rogers, 16821 Taft Ave., Orange, Calif., CA **$435,000**, 30 stucco DWELLINGS, 1710-1892 N. Green Grove, Tract 4012, ORANGE, CALIF. State Mutual Save. & Loan, 415 W. 5 St., Los Angeles, Calif.

Trebor Constr. Co., 8620 Beverly Blvd., Los Angeles, Calif., Owner Builds, **$546,000**, 43 stucco DWELLINGS, **Tract 1304, Pope and Orr Sts.**, SIMI, CALIF.

CANADA

HEAVY CONSTRUCTION—BA

Ont., Toronto—BA 7/4—Municipality of Metropolitan Toronto, 67 Adelaide St. E., rein.-conc., structural steel BRIDGE, roads, sidewalk, services, lighting Jane St. over CPR and CNR tracks, over $88,000. Plans deposit $100. CD 11/9/60.

▲ **ONTARIO**—BA 7/12—Ontario Dpt. Hys., Downsview, ROADS,
Kenora—grading, drainage, structure 10.39 mi. Hy. 11, Rainy Lake Causeway easterly (61-03). $875,000.
Sudbury—grading, drainage, granular base and hot mix pavement 3.8 mi. Hy. 69 from north limits Sudbury northerly (61-22). $650,000.

Ont., Toronto—BA 7/17—Twp. of Etobicoke, 540 Burnhamthorpe Rd., steel girder BRIDGE with rein.-conc. deck, abutments, wing walls, alignment of West Branch of Humber River, $200,000. Plans deposit $100.

BUILDINGS—BA

▲ **Ont., Windsor**—BA 7/12—Ontraio Dpt. P. Wks., East Block, Parliament Bldgs., Toronto, ONTARIO TEACHERS' COLLEGE. **$1,000,000**. Plans deopsit $150.

Ont., Dunnville—BA 7/13—Haldimand War Memorial Hospital, Dunnville, HOSPITAL ADDN., $500,000. Plans deposit $300. Herbert R. Agnew, 25 Merten St., Toronto, archt.

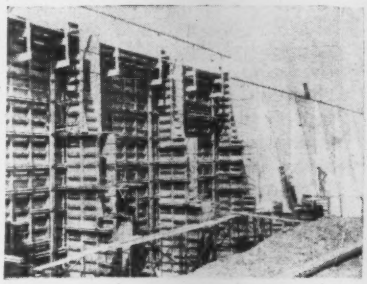
▲ **Ont., Toronto**—BA 8/4—City, City Hall, CITY SQUARE and twin, curved skyscraper CITY HALL, with central domes, council chamber, registry and library. Over $20,000,000. Viljo Rewell, Helsinki, Finland, archt. John B. Parkin Assocs., 1500 Don Mills Rd., Toronto, assoc. archts. CD 11/14/58.

CANADA

HEAVY CONSTRUCTION—LB & CA

▲ **Mannix Co. Ltd.**, 737 8th Ave., SW, Edmonton, Alta., CA **$7,400,000**, DRILLING, PRESSURE GROUTING, Grand Rapids Hydro Project, Contract 3, MANITOBA. Manitoba Hydro-Electric Bd., P.O. Box 815, Winnipeg, Man. CD 2/8/60;
Creaghan & Archibald Ltd., 1440 St. Catherine St. W., Montreal, Que., CA **$2,800,000**, DRILLING and PRESSURE GROUTING, Grand Rapids Hydro Project Contract 2 (Manitoba).

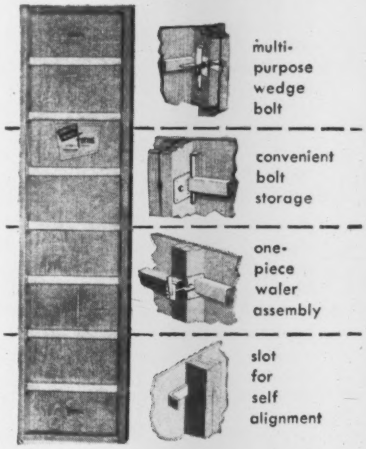
Again...
SIMPLEX-WACO
Comes Through
on a Big One



adaptability and flexibility
of Simplex-Waco Forms
proved on giant shopping center

- Simplex-Waco Forms went up with ease in forming 32′ battered wall and counterforts at suburban Minneapolis' Southdale Shopping Center.
- Robertson Q. panels nailed to Simplex-Waco panels to produce architectural finish in other parts of project.
- Forms were used both vertically and horizontally . . . proving Simplex-Waco flexibility! Over 26,000 sq. ft. of forms used on this project.
- Forms available on sales or rental/purchase plan.

DISTRIBUTORSHIPS OPEN
IN CHOICE AREAS



Send Your Plans for Free
Layout and Cost Estimate

Simplex Waco
SIMPLEX INDUSTRIAL
FORMS, INC.
5627 Industrial Avenue
Rockford (Loves Park) Illinois

CIRCLE 283 ON READER SERVICE CARD

COMMENT
from the
BUTLER ENGINEER

. . . Of a Giant Expansion to Meet Cement Demand

One of the great cement companies—with a confident eye to the immediate future—has just entered upon a nation-wide, multi-million dollar program in expansion and the establishment of new supply centers. It's big. And it means a whale of a lot to you—Mr. Ready Mix, Mr. Concrete Products and to you—Mr. Roadbuilder. First, because the program is based upon a careful study of immediate demand for cement. Second, because you will profit enormously from this activity. Companies of this magnitude don't bet millions if the future looks uncertain.

And we're glowing because those storage bins are made by Butler. Each line of 4 bins holds 8289 cu. yds. — and there are 9½ lines. And all are equipped with Butler Gates and Airflomatic Feeders.

Incidentally, just to show you versatility in metals which Butler fabricates, we recently completed 5 *aluminum* bins, each of 392 yards capacity, for a large chemical company. It was a solution to a contamination problem. So what metal do you want? Let us know.

The Concrete Masonry Exhibits in the handsome and newly completed Cobo Hall, Detroit, was a lively and inspiring success . . . but there were many who figured it would be a colossal flop. Trouble stemmed from a jurisdictional misunderstanding by the unions. Really not intentional; it was born of inexperience in routines attendant upon a big machinery show. Situation beautifully and diplomatically handled by Mayor Miriani, and by a rational attitude by the unions—once they understood.

Recession? Man! We're busy.

The Butler Engineer

BUTLER BIN COMPANY
WAUKESHA, WISCONSIN

▲ **C. A. Pitts General Contractor Ltd.**, 30 Commercial Rd., Toronto, Ont., LB **$1,920,226,** (13 bidders), rein.-con. structural steel ELEVATED STRUCTURES, F. G. Gardner Expressway, Spadina Ave. to Rees St. and Lake Shore Blvd., eastbound roadwork, R-17-61, TORONTO, ONT. Municipality of Metropolitan Toronto, 67 Adelaide St., E. Toronto, Ont. BA 6/6/61. CD 5/25/61.

▲ **Spino Constr. Co., Ltd.**, 200 Sauve St. W., Montreal, Que., LB **$1,415,905**, INTERCEPTOR SEWER TUNNEL, RELATED STRUCTURES (a) approx. 6,300 ft. 6 in. tunnel; (b) 6,700 ft. 7 in. tunnel, both in rock, OTTAWA, ONT. City, City Hall, Ottawa, Ont. BA 6/6/61. CD 6/18/61.

▲ **J. D. Stirling Ltd.**, 2199 Jarry St. E., Montreal; and **Walsh Canadian Constr. Co. Ltd.**, Edouard VII Blvd., Brossard, Que., LB **$1,184,441**, WHARF, section 65 to 68, Montreal Harbour, MONTREAL, QUE. National Harbours Bd., Hunter Bldg., Ottawa, Ont. BA 6/8/61. CD 5/15/61.

▲ **Wappel Concrete & Constr. Co. Ltd.**, 302 Canada Permanent Bldg., Regina, Sask., CA **$1,251,999**, extension RUNWAY, enlarging aircraft parking apron, surf. treatment of taxiways, etc., Saskatoon Airport, SASKATOON, SASK. Dpt. Transport, Hunter Bldg., Ottawa, Ont. BA 4/21/61. CD 5/1/61, under LB.

BUILDINGS—LB & CA

▲ **Bennett-Pratt Ltd.**, 5 Maple Leaf Drive, Weston, Ont., CA Est. **$1,200,000,** masonry Davisville PUBLIC SCHOOL and METROPOLITAN SCHOOL for the Deaf, steam heating, TORONTO, ONT. Bd. Educ., 155 College St., Toronto, Ont. BA 5/11/61. CD 4/19/61.

▲ **H. J. McFarland Constr. Co. Ltd.**, Talbot St., Picton, Ont., CA Phase 1, roads, drainage, levelling site for CHOCOLATE PLANT, Lorne St. East, SMITH FALLS, ONT. Hershey Chocolate Corporation, 19. E. Chocolate Ave., Hershey, Pa., U.S.A. Total est. $7,000,000. CD 2/6/61.
M. Sullivan & Son Ltd., Elgin St., Arnprior, Ont., CA Phase 2, concrete foundations, piers for CHOCOLATE PLANT, Lorne St. E. (Smith Falls, Ont.).

▲ **Charles Huffman Ltd.**, 252½ Charlotte St., Peterborough, Ont., CA Est. **$1,300,000,** 75,000 sq. ft. SHOPPING PLAZA, Brookdale Plaza, PETERBOROUGH, ONT. Sands & Bateman Ltd., 359 Aylmer St. N., and Rishor, Barnes & Dietrich Ltd., 474 George St. N., both of Peterborough, Ont.

▲ **G. Barker Constr. Ltd.**, 83 Commissioner Rd., RR 4, London, Ont., LB **$1,616,440** (11 bidders), 2 story, low rental HOUSING UNITS, 6 story APARTMENTS, Scarlett Rd., TORONTO, ONT. Central Mortgage & Housing Corp., 650 Lawrence Ave. W., Toronto, Ont. BA 6/8/61. CD 5/31/61.

▲ **Barnabe & Fils Ltee.**, 1205 2nd Ave., Quebec City, Que., CA **$1,204,000**, SECONDARY SCHOOL, 3 story, rein.-con. RESIDENCE, LEVIS, QUE. Catholic School Comn. of Levis, Levis, Que. BA 4/24/61. CA 6/8/61. CD 5/2/61, under LB.

▲ **Louis Donolo, Inc.**, 8320 St. Lawrence Blvd., Montreal, Que., CA Est. **$1,250,000,** 1 story, 135 x 360 ft., concrete, brick, rein.-con. BOWLING ALLEY, Upper Lachine Rd., MONTREAL, QUE. The Rose Bowl Lanes, c/o Harold Ship, archt., 5135 Western Ave., Montreal, Que. CD 2/20/61.

PUERTO RICO

HEAVY CONSTRUCTION—BA

† **Puerto Rico, Fort Allen**—BA 7/18—U. S. Eng., P.O. Box 4970, Jacksonville 1, Fla., U.S.A., HUMIDITY CONTROL for Communications Center Bldg., ENG-08-1, 23-61-94. $25,000. CD 6/8/61.

LATIN AMERICA

HEAVY CONSTRUCTION—BA

▲ **ARGENTINA**—BA 7/7—Direccion Nacional de Vialidad, Av. Maipu 3, Buenos Aires, ROAD,
bit. surf. Rte. 26, Pampa del Cerro Dragon, Chubut, Rawson. $1,343,000.

BUILDINGS—BA

▲ **Argentina, Zapala**—BA 7/17—Ministry Economy, Neuquen, Prov. Neuquen, Argentina, PORTLAND CEMENT PLANT, Neuquen Province. $1,335,000. CD 4/14/61.

BUILDINGS—LB & CA

▲ **Pueyrredon Construcciones S.A.**, Pueyrredon 860, Buenos Aires, Argentina, CA Est. **$5,625,000**, 6 monoblocks, 21 floors each 924 unit, 65,000 sq. meters APARTMENT, between Brasil, Inclan, Matheu and Alberti Sts., BUENOS AIRES, ARGENTINA. Confederation Gen. Empleados de Comercio, Rivadavia 1445, Buenos Aires, Argentina. Miguel C. Rocca, Sarmiento 2293, Buenos Aires, Argentina, archt.

FOREIGN

HEAVY CONSTRUCTION—BA

Malaya—BA 9/4—At Office Preece, Cardew & Rider, engrs., 8, 10 & 12, Queen Anne's Gate, London, S.W. 1, England, supply and erect 132 kv and lower VOLTAGE CABLES, Cameron Highlands Scheme, Contr. 7 for Central Electricity Bd., Federation of Malaya, Kuala Lampur.

PROPOSED PROJECTS

WATER SUPPLY

▲ **Colo., Littleton**—Cherry Creek Valley Water & Sanitation Dist., 2000 S. Dayton, bond election June 26, WATER SUPPLY LINE, BOOSTER STATION and DISTRIBUTION SYSTEM, near Denver, Approx. **$2,000,000.** Ripple & Howe, Inc., 2747 Zuni, Denver, consult. engr.

SEWERS, WASTE DISPOSAL

▲ **Colo., Denver**—Denver Metropolitan Sanitation Dist., Denver, TREATMENT PLANT, COLLECTOR SEWER LINES to process all area sewage. **$24,000,000.** Metro Engineers, c/o Orlie Phillips, Phillips Carter & Orsborn, Insurance Bldg., consult. engrs.

▲ **Colo., Littleton**—Cherry Creek Valley Water & Sanitation Dist., 2000 S. Dayton, bond election June 26, SEWER LINES, near Denver, **$1,000,000.** Ripple & Howe, 2747 Zuni, Denver, consult. engrs.

▲ **Fla., Melbourne**—City, City Hall, extending SANITARY SEWERAGE SYSTEM. **$1,450,000.** Reynolds, Smith & Hill, 227 park St., Jacksonville, engrs., CD 3/24/61.

▲ **Ga., Brunswick**—City, City Hall, SEWAGE TREATMENT PLANT, **$2,170,000.** Wiedeman & Singleton, P. O. Box 1878, Atlanta, Ga., consult. engrs.

▲ **Okla., Tulsa**—City, City Hall, voted bonds June 6, STORM SEWERS, **$3,500,000.** W. R. Wooten, City Hall, city engr. CD 12/17/56.

▲ **Wash., Lynwood**—City, City Hall, voted bonds May 23, SEWERAGE SYSTEM, **$2,700,000.** Reid, Middleton & Associates, Edmonds, engrs. CD 6/1/61.

BRIDGES

▲ **O., Dayton**—City, City Hall, St. Clair Street BRIDGE. $1,000,000. CD 12/27/43.

AIRPORTS

▲† **Ala., Huntsville**—National Aeronautics & Space Admin., George C. Marshall Space Flight Center,
EXPANSION of BLOCKHOUSE, Marshall Space Flight Center, **$2,500,000,** no appropriation.
LIQUID HYDROGEN FACILITY, Marshall Space Flight Center, **$1,700,000**, no appropriation.
HIGH-VACUUM TEST FACILITY, Marshall Space Flight Center, **$701,000,** no appropriation.
ENGINEERING BUILDING ADDN., Marshall Space Flight Center, **$510,000,** no appropriation.
PRIMARY UTILITIES EXTENSION, Marshall Space Flight Center, **$420,000,** no appropriation.
LOX STORAGE for powerplant test stand, Marshall Space Flight Center, **$600,000,** no appropriation.
LOAD TEST ANNEX, Marshall Space Flight Center, **$1,703,000,** no appropriation.
TECHNICAL SERVICES FACILITY, Marshall Space Flight Center, **$757,000,** no appropriation.

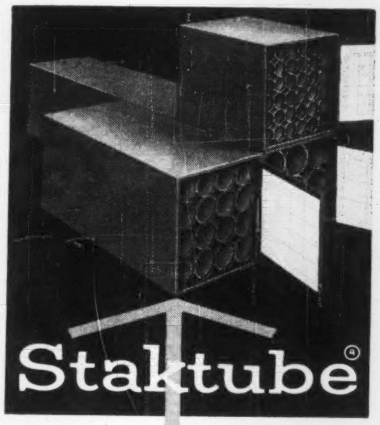
▲† **Calif., Moffett Field**—National Aeronautics & Space Admin., Ames Research Center, Moffett Field, HYPERVELOCITY FREE FLIGHT FACILITY, Ames Research Center, **$4,880,000,** no appropriation; MODIFICATIONS to FLIGHT OPERATIONS LABORATORY, Ames Research Center, **$800,000,** no appropriation.

▲† **Calif., Pasadena**—National Aeronautics & Space Admin., Jet Propulsion Laboratory, Pasadena,
PHYSICAL SCIENCES LABORATORY, Jet Propulsion Laboratory, **$1,285,000,** no appropriation.
UTILITIES, **$735,000,** no appropriation.
VEHICLE ASSEMBLY BLDG. ADDN., **$610,000,** no appropriation.
MATERIALS RESEARCH LABORATORY, **$515,000,** no appropriation.
MODIFICATION to STRUCTURAL TEST LABORATORY, **$262,000,** no appropriation.

† **Calif., Point Arguello**—National Aeronautics & Space Admin., Pacific Missile Range, Point Arguello, LAUNCH OPERATIONS FACILITIES, Pacific Missile Range, **$998,000,** no appropriation. CD 7/16/59.

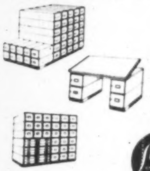
▲† **Fla., Cocoa**—National Aeronautics & Space Admin., Atlantic Missile Range, Cape Canaveral,
MODIFICATIONS to LAUNCH COMPLEX NO. 36, Atlantic Missile Range, **$18,800,000,** no appropriation.
MODIFICATIONS to SATURN LAUNCH COMPLEX NO. 37, Atlantic Missile Range, **$11,000,000,** no appropriation.
MODIFICATION to SATURN LAUNCH COMPLEX NO. 34, Atlantic Missile Range, **$2,800,000,** no appropriation.
LIQUID HYDROGEN SYSTEM for Saturn Launch Complex No. 34, Atlantic Missile Range, **$2,800,000,** no appropriation.
COMPLETION to SATURN LAUNCH COMPLEX NO. 37, Atlantic Missile Range, **$10,961,000,** no appropriation.
EXTENSION to ASSEMBLY BUILDING, Atlantic Missile Range, **$1,035,000,** no appropriation.
SPACECRAFT FACILITY, Atlantic Missile Range, **$844,000,** no appropriation.
CENTRAL SHOP AND MAINTENANCE FACILITY, Atlantic Missile Range, **$743,000,** no appropriation.

▲ **Me., Bangor**—U. S. Eng., P.O. Box 977, Portland, HOSPITAL, Dow Air Force Base, **$1,600,000** funds released. CD 8/1/60.



Stacor's lifetime steel

ROLL FILE SYSTEM



"Easy-file easy-find" system to keep rolled prints, plans, maps clean, safe. 32 sizes—8 lengths, 4 tube diameters.

Send NOW for illustrated catalog

STACOR EQUIPMENT CO.
279 Emmet St., Newark, N. J.
Phone: BIgelow 2-6600

CIRCLE 61 ON READER SERVICE CARD

FACTS to simplify water supply planning

BULLETIN B-1400 has many helpful tips to help you select and specify SUMO SUBMERSIBLES for municipal and industrial water supply and in-line booster pump service. Included are construction details and performance data. 3550 and 1750 rpm models.

BULLETIN B1400
Sumo
high capacity 3550 and 1750 RPM deepwell
SUBMERSIBLE PUMPS
For
Industry and plant services
Commercial buildings and air conditioning
Large scale farm use and irrigation
School water supply
Municipal water supply
Booster systems
THE PUMPS THAT STAND THE TEST

Send for your FREE copy today!

SUMO PUMPS INC. Brown House Rd. Stamford, Conn.

CIRCLE 62 ON READER SERVICE CARD

▲† Md., Greenbelt—National Aeronautics & Space Admin., Goddard Space Flight Center, Greenbelt, ENVIRONMENTAL TESTING LABORATORY, Goodard Space Flight Center, **$7,287,000**, no appropriation: ISOLATION LABORATORY, **$775,000**, no appropriation.

▲† O., Cleveland—National Aeronautics & Space Admin., Lewis Research Center, 21000 Brookpark, Cleveland, HYDROGEN HEAT TRANSFER FACILITY, Lewis Research Center, **$2,550,000**, no appropriation; MODIFICATIONS SPACE ENVIRONMENT TANK, Lewis Research Center, **$1,040,000**, no appropriation.

▲† Virginia—National Aeronautics & Space Admin., Wallops Station, Wallops Island,
ADVANCED TRACKING SYSTEM, Wallops Station, **$4,845,000**, no appropriation.
DYNAMIC BALANCING FACILITY, Wallops Station, **$843,000**, no appropriation.
ROCKET STORAGE AREA, Wallops Station, **$400,000**, no appropriation.
MODIFICATIONS RANGE SAFETY SYSTEMS, Wallops Station, **$225,000**, no appropriation.

▲† Va., Langley Field—National Aeronautics & Space Admin., Langley Research Center, Hampton, HIGH-VACUUM SPACE STRUCTURES FACILITY, Langley Research Center, **$1,480,000**, no appropriation.

UNCLASSIFIED

▲ Mo., St. Louis—Missouri Botanical Garden, Bd. Trustees, 2315 Tower Grove Ave., Zone 10, low-rise conventional design RESEARCH BLDG. with 3 floors, 2 story glass enclosed entrance area, etc., north end of Shaw's Garden. **$1,000,000.** Bids early 1962.

▲ Oklahoma, Kansas, Missouri, Illinois—Oklahoma Illinois Gas Pipeline Co., c/o Fish Engineering Corp., consult. engrs. M & M Bldg. Houston, Tex., 550 mi. NATURAL GAS PIPE LINE from near Woodard, Okla. in Anadarko basin to St. Louis, Mo. with river crossing near St. Louis into western Illinois. **$34,500,000.**

▲ Pa., Pittsburgh—City, Dpt. Parks & Recreation, City-County Bldg., plans by Community Planning Services, 607 Garden City Dr., Box 98, Monroeville, REHABILITATING MAIN ZOO BLDG., Highland Park, **$1,180,000.** CD 4/5/61.

▲ Va., Fairfax—Washington Gas Light Co., 110 H St., N. W., Wash., D. C., MINED CAVERN PROPANE STORAGE FACILITY, Burke area. **$3,000,000.**

PUBLIC BUILDINGS

Calif., Duarte—Duarte Unified School Dist., 1427 Buena Vista Ave., plans by Smith, Powell, Morgridge, 208 W. 8 St., Los Angeles, 42,000 sq. ft. Duarte HIGH SCHOOL ADDN. **$700,000.** CD 4/4/61.

▲ Calif., Palm Desert—Coahcella Valley Junior College Dist., 74,723 Hy. 111,
plans by Wexler & Harrison, 557 S. Palm Canyon Dr., Palm Springs, Calif., and John Carl Warnecke & Assoc., 55 New Montgomery St., San Francisco, Calif., concrete tilt-up and wood frame LIBRARY **$752,000.** CLASSROOM and SHOPS. **$905,000.** Bids late June 1961.
plans by Frey & Chambers, 879 N. Palm Canyon Dr., Palm Springs, Calif., CAMPUS CENTER, ADMINISTRATION BLDGS., DINING HALL, **$986,000,** Bids in three weeks;
plans by Williams & Williams, 121 S. Palm Canyon Dr., Palm Springs, Calif., PHYSICAL EDUCATION BLDGS. **$1,080,600,** Bids in three weeks.

▲ Colo., Rocky Ford—Otero County School Dist. R-2, voted $1,280,000 bonds May 29, 1 and 2 story, 75,000 sq. ft. HIGH SCHOOL, **$1,090,000.** Paul S. Pierson, 285 University Bldg., Denver, Colo., archt. Caudill-Rowlett & Scott, 3400 Montrose Blvd., Houston, Tex., assocs. archts. CD 5/4/61.

▲ Conn., Middletown—State P. Wks. Dpt., 165 Capitol Ave., Hartford, plans by Pederson & Tilney, 155 Whitney Ave., New Haven, **State Purchasing Dpt.,** OFFICE and WAREHOUSE, **bakery,** meat cutting plant, **frozen food locker,** Silver St. **$1,200,000.** Hill & Harrigan, 909 Whalley Ave., New Haven, Conn., consult, engrs. A. John Macchi, 44 Gillett St., Hartford, struc. engr. CD 6/2/61.

▲ Fla., Miami—Dade County Bd. Pub. Instruction, 1410 NE 2nd Ave., **Junior** HIGH SCHOOL, NW 62nd St. and Royal Poinciana Dr., Miami Springs, **$750,000; Junior High School,** east of SW 97th Ave. between 62 and 64th Sts., **$750,000; Junior High School,** NW 183rd St. and 33rd Place, **750,000.**

▲† Ga., Atlanta—General Services Admin., 19th and F Sts. NW, plans by Robert & Co. Assocs., archts.-engrs., 96 Poplar St., NW, OFFICES, **Laboratories, Shops** and **Warehouses** for Health, Education and Welfare, **$9,890,000** no appropriation.

▲ Ill., Carbondale—Southern Illinois University Carbondale, PHYSICAL EDUCATION BLDG. **$3,500,000.**

▲ Ill., DeKalb—Northern Illinois University plans by Gilbert A. Johnson, American National Bank Bldg., Rockford, SPECIAL EDUCATION BLDG., **$1,500,000;** LIBRARY ADDN., **$1,000,000;** plans by Samuelson & Sandquist, 6330 N. Cicero Ave., Chicago, PRACTICAL ARTS BLDG., **$1,750,000;** PHYSICAL EDUCATION BLDG., for WOMEN, **$2,300,000;** plans by Graham Anderson Probst & White, 201 N. Wells St., Chicago, Zone 6, SCIENCE BLDG., **$2,750,000;** plans by Kenneth Thelen, 151½ N. 4th St. DeKalb, PHYSICAL PLANT BLDGS., **$270,000.**

CONCRETE PROOF:

10 Reasons Why You Should Use

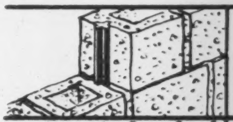
WAL-JOINT®

PVC* Wall Reinforcement For All Your Porous Masonry Wall Construction Work

1 Waljohn's PVC* WAL-JOINT® maintains the accurate alignment of concrete or cinder-block wall sections
2 Allows for different stresses on a building caused by heavy traffic, the expansion & contraction movements due to climate & temperature changes
3 Keeps walls from buckling or bowing
4 Easily handled; Easily installed on location
5 Quickly & efficiently cut — leaves no ragged or frayed edges — CUTS CLEAN
6 Easily & effectively butted
7 Delivered to you in 8 ft. lengths; packed in easily stacked cartons
8 Does not deteriorate — has greater life expectancy than other material
9 Cheaper foot-for-foot than any other material
10 Has a greater elongation and expansion factor than other materials used for same purpose

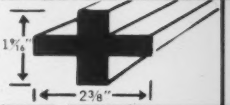
Perfect for the elimination of building fatigue and construction failure . . . acts as wall stabilizer and shock-absorber. WAL-JOINT'S greater expansion and contraction factor makes it "breathe" with the building—promotes longer life for porous masonry walls.

*PVC means Polyvinylchloride Plastic, which is superior to any other wall joint material . . . Safer, Cheaper, Easier to Handle, Gives Greater Wear.

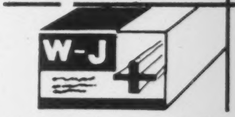


Simple to Install and Cut on Location.

Wal-Joint fits snugly into block.



Waljohn's PVC* Wal-Joint is extruded to 2⅜" across x 1⁹⁄₁₆" high in Light Green.



Available in Convenient 8 ft. lengths in Easily Handled, Easily Stored Carton.

Call us for Facts and Figures on how WAL-JOINT® fits into your construction picture. Ask for Free Sample, Test Reports and Prices.

Prime Mfrs.— WALJOHN WATERSTOP, Inc.
A Division of Waljohn Plastics, Inc.
400 88th Street, Brooklyn 9, New York
SHore Road 8-0300

Another Fine Plastic Extrusion for Building — WATERSTOPS • CHAMFER-STRIPS • WAL-JOINTS

CIRCLE 285 ON READER SERVICE CARD

Seven years of field experience prove it!

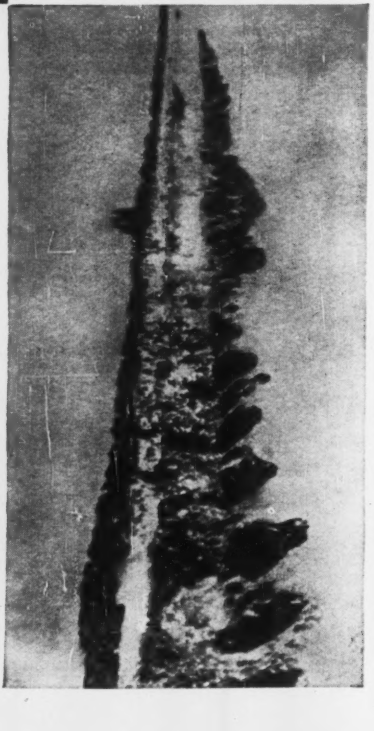
YOU CAN MAKE

BROKEN ABUTMENTS: Restored stronger than new by brushing on polysulfide-epoxy adhesive to rejoin old concrete, or to bond fresh concrete to old.

FASTENING TRAFFIC MARKERS. Fixed to road surface with polysulfide epoxy adhesive alone, lane strips have stayed rigidly in place for long periods of time.

FILLING RUTS AND DIPS. Adhesive and aggregate mixed in ratio of 1 to 5 is spread and troweled right over depressed area. No digging down to roadbed or exposing steel reinforcements.

SPALLED JOINTS: Repaired in two hours by using polysulfide-epoxy mixed with aggregate as trowelable compound. Reduces tie-up time as much as 48 hours.



LITTLE OF BIG REPAIRS

...with concrete adhesive based on THIOKOL liquid polysulfide polymer

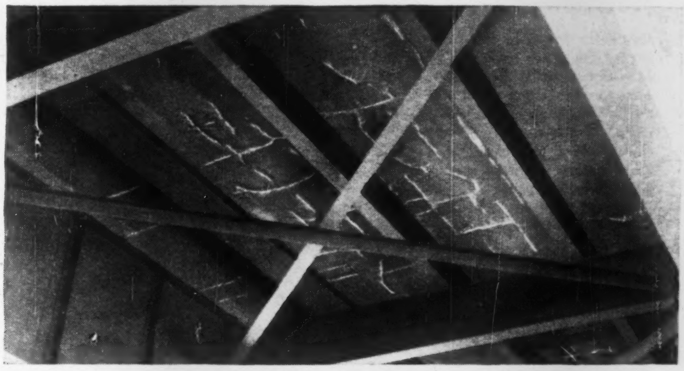
Two chemicals in combination, THIOKOL liquid polysulfide polymer and epoxy resin, are providing one of the most useful engineering tools of our time.

Together, they produce a brushable, quick-cure adhesive used to join old or fresh concrete to old...to bond skid-proofing materials to roadways...to seal and protect surfaces against chemical attack and water seepage. The resultant bond is stronger than concrete itself, waterproof, acid resistant, and flexible enough to withstand repeated freeze-thaw cycles.

Repairs which heretofore required days of labor and road downtime, the use of heavy equipment and large crews of men are now being completed at a fraction of the cost in time, manpower, material and dollars. Serviceability of such repairs is, by actual experience, proving more satisfactory than those achieved by conventional methods.

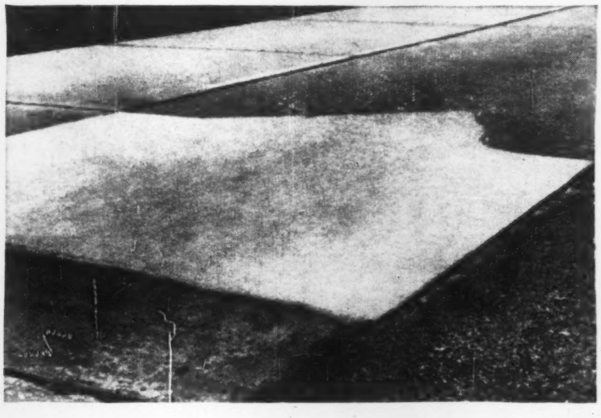
Want to know more about this new engineering material? How it's used? Where it's used? The benefits and economies that accrue? Write to Thiokol for brochure CA-200.

POT HOLES: Repaired to featheredge and ready for traffic in as little as three hours when patched with mortar mix of polysulfide-epoxy, sand or aggregate.



HAIRLINE CRACKS: Filled with polysulfide-epoxy. Adhesive film sprayed or brushed over surface seals out water, checks further deterioration.

SCALED AREAS: Repaired in only a few hours with adhesive containing THIOKOL liquid polysulfide polymer. Bonds new concrete to old. Watertight bond stronger than concrete itself.



Thiokol®
CHEMICAL CORPORATION
780 N. Clinton Ave., Trenton 7, N. J.
In Canada: Naugatuck Chemicals Division,
Dominion Rubber Company, Elmira, Ontario

Gentlemen: Please send me your Brochure CA-200 dealing with concrete adhesives applications and methods.

NAME____________________

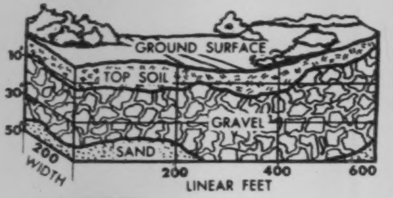
FIRM____________________

ADDRESS____________________

CITY__________STATE__________

CIRCLE 287 ON READER SERVICE CARD

.. determine SUB-SOIL LAYERS



Model 274M "Michimho"

ELECTRO-GROUND

Shows

Type of Material, Location and Quantity

Complete determinations of sub-soil layers are made with this 20-pound instrument. Drive the short test rods into surface earth and employing the internationally accepted "Barnes Layer" method . . . location and composition of layers 100-ft. or more below the surface can be accurately plotted.

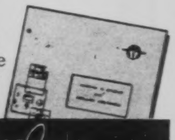
- **Cuts Costs**
- **Saves Time**
- **More Accurate Bids**
- **No Drilling**
- **No Dynamiting**
- **One-Man Instrument Operation**

Whether locating gravel deposits, seeking data on bedrock in cut areas, or determining sub-soil stability for construction plans . . . the Model 274M ELECTRO-GROUND will quickly provide dependable data. Write for complete information.

LOW PRICE.. only $575^{00}

Saves its cost on one job!

Write for
New Manual E-63
containing complete
operating data



1-35.5

ASSOCIATED RESEARCH, *Incorporated*

3747 W. Belmont Avenue • Chicago 18, Illinois

CIRCLE 288 ON READER SERVICE CARD

COMMERCIAL BUILDINGS

▲ **Conn., Bridgeport**—Inter-Church Residence, Inc., c/o Council of Churches of Greater Bridgeport, 30 Elmwood Place, Cooperative APARTMENT DEVELOPMENT for AGED, **$1,000,000.**

▲ **Fla., Hallandale**—Beach Apartments, c/o Claus Moberg, archt., 1928 Tyler St., Hollywood, APARTMENT. **$2,500,000.**

▲ **Fla., Key West**—Samuel Hyman, c/o M. Tony Sherman & Assocs., archts.-engrs., 1700 Sans Souci Blvd., North Miami, 1 and 2 story, 250,000 sq. ft., air conditioning SHOPPING CENTER, Roosevelt St. and Sigsbee Rd. **$2,000,000.**

▲ **Fla., North Miami Beach**—Bell Development Corp., 18400 N.W. 23rd Ave., Miami, plans by Gerber-Pancani & Crowder, DuPont Plaza Center, Miami, 9 story, rein.-con., steel, 140,000 sq. ft. Eastern Towers APARTMENTS, N.E. 166th St. and N.E. 38th Ave. **$1,750,000.** B. S. Warshaw, 255 University Dr., Coral Gables, struct. engrs. Sasnett Engr., Inc., Dupont Plaza Center, Miami, mech. engr.

▲ **Ill., Chicago**—Roosevelt University, 430 S. Michigan Ave., Zone 5, plans by Skidmore, Owings & Merrill, 30 W. Monroe St., Zone 3, AUDITORIUM THEATER RESTORATION. **$2,700,000.** CD 11/9/59.

▲ **Ill., Ottawa**—Carson Pirie Scott & Co., State and Madison Sts., Chicago, Zone 2, DEPARTMENT STORE. **$1,100,000.** Bids in Fall 1961.

▲ **Ill., Park Ridge**—Lutheran General Hospital, 1775 Dempster St., plans by Burnham & Hammond, 53 W. Jackson Blvd., Chicago, Zone 4, HOSPITAL CLINIC. **$5,000,000.**

COMMERCIAL BUILDINGS

▲ **N. Y., Brooklyn**—Lester Brook and Asen Brothers, Inc., 6320 Ave. N, Zone 34, plans by Samuel Gardstein & Son, 76 Court St., Brooklyn 1, N. Y., The Channels, 205 HOME COMMUNITY, Arkansas Dr. and Bassett Ave., Mill Basin Section, Over **$8,000,000;** 3,250 ft. BULKHEAD for the Channels Home Community, **$320,000.**

▲ **N. Y., Hempstead**—Enroy Realty Corp., c/o Edward C. Adlman, 246 Kent Dr., Hewlett, 6 story, 150-room HOTEL, heliport on roof, Fulton and South Sts. **$2,000,000.**

▲ **N. Y., New York**—Irving Maidman Assocs., 1501 Broadway, Zone 36, plans by Wechsler & Schimenti, 118 E.25 St., Zone 10, 12 story 30,000 sq. ft. 140 unit PENTHOUSE APARTMENT, bsmnt. garage, W.43 St., East of 9th Ave. **$2,000,000.**

N. Y., New York—Leon Weiser, Inc., c/o Leo Stillman, archt., 332 E. 149 St., Zone 51, 6 story APARTMENT, incl. STORES and GARAGE, 401 W. 56 St. **$850,000.** Greenhut & Taffel, 114 E. 32 St., Zone 16, struct. engrs. CD 5/17/61.

▲ **N. C., Durham**—Duke University, Administration Bldg., plans by J. N. Pease & Co., 2925 N. Independence Blvd., Charlotte, 192 unit MARRIED STUDENTS APARTMENT. Over **$1,000,000.**

▲ **N. C., Durham**—Watts Hospital, Club Blvd., plans by Kiff, Colean, Voss & Soulder, office of York and Sawyer, 230 Park Ave., New York, N. Y., HOSPITAL ADDN. **$5,000,000.**

▲ **N. C., High Point**—Cleveland Investments of Shelby, Inc., Shelby, SHOPPING CENTER, Westchester Drive, **$1,500,000.**

▲ **O., Cincinnati**—College of Mt. St. Joseph, Delhi Park, CONVENT and MOTHERHOUSE ADDNS., ALTERATIONS. **$1,500,000.** Bids late 1962.

▲ **Okla., Tulsa**—Petroleum Club Corp., 8th and Boulder St., plans by Kelley & Marshall, 1620 S. Elwood Sts., 15 story PETROLEUM CLUB. **$2,500,000.** Bids 1/62.

Pa., Jamison—Meyer C. Rose & Albert Sussman, Market St. Natl. Bank Bldg., Phila., CLUBHOUSE, GOLF COURSE, SWIMMING POOL, 117 acre tract, Over **$750,000.**

▲ **Tex., Lubbock**—Owner, c/o Leroy Elmore, 2109 Ave Q, 1 story, 100,000 sq. ft., masonry A/C SHOPPING CENTER, rein.-con. fdn. 50th St. and Ave. Q, **$1,000,000.**

INDUSTRIAL BUILDINGS

▲ **Calif., Oakland**—Gilmore Steel Corp., 840 Brannan St., San Francisco, 123,000 sq. ft. DISTRIBUTION PLANT EXPANSION, 18 and Poplar Sts. **$1,500,000.**

▲ **O., Columbus**—Columbus Terminal Warthouse Co. & Central Ohio Warehouse Co., 392 McCoy St., WAREHOUSE EXPANSION, 21st and Gifford Aves. **$2,225,000.**

▲ **S. C., Clinton**—The Torrington Co., 59 Field St., Torrington, Conn, 1 story 140,000 sq. ft, BEARINGS MFG. PLANT **$1,500,000.**

▲ **Tex, Tyler**—The Kordite Co., (Div. of Natl. Distillers & Chemical Corp.) Main St. Macedon, N.Y., PLANT, mfg. plastic products, 17 acre site in Industrial Foundation tract, **$1,000,000;** REPAIR SHOP, **$110,000;** STORAGE for WAREHOUSING, **$125,000.**

▲ **Man., Carberry**—J. R. Simplót Co., West of City, Caldwell, Idaho, U.S.A. POTATO PROCESSING PLANT. **$2,500,000.**

▲ **Ont., Clarkson**—British American Oil Co., Ltd., 800 Bay St., Toronto, CYCLOHEXANE PLANT, Clarkson Refinery. **$4,000,000.**

for dependable, 'round-the-clock service . . .

WEINMAN immersible non-clog pumps

Weinman Type M Immersible Pumps handle sewage, drainage water and industrial wastes fast and efficiently . . . 24 hours a day . . . with little maintenance. Perfect for permanent installation or portable "trouble-shooting" units; quick and easy to dismantle, move and install. Permanent simplex and duplex pump installations furnished with sumps and sump covers.

Simple design, with non-clog impeller, makes maintenance easy; rugged cast iron casing resists corrosion and gives maximum protection in liquids up to 104°F. (Hotter liquids handled under special conditions.) Available with accessories for automatic pump control.

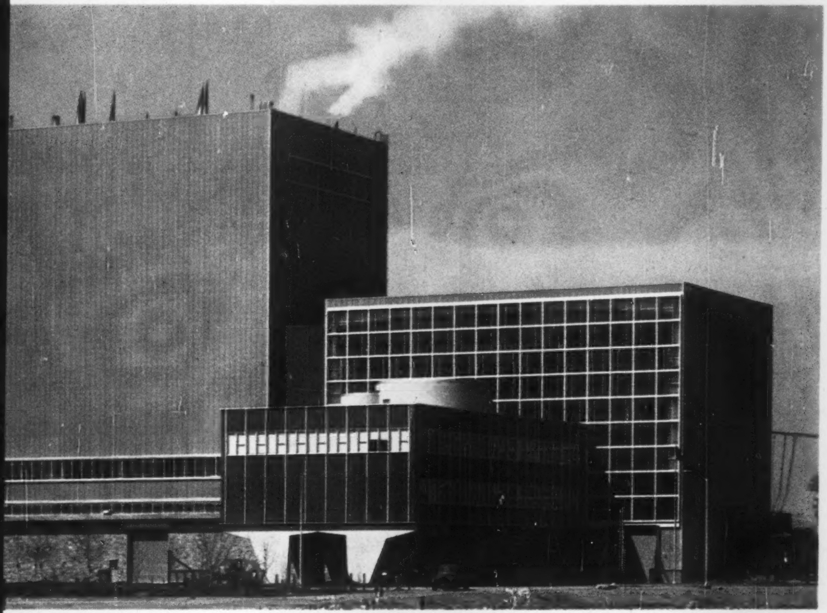
Whatever your pumping problem . . . there's a Weinman-designed pump to meet your precise requirements. Call your Weinman Pump Specialist, today . . . he's in the Yellow Pages. Or, write direct for our new Bulletin 1710.

WEINMAN PUMP
290 SPRUCE STREET COLUMBUS 15, OHIO
CENTRIFUGAL SPECIALISTS

CIRCLE 63 ON READER SERVICE CARD

BLANDIN PAPER COMPANY

BLANDIN PAPER COMPANY, Grand Rapids, Minn., Ellerbe and Co., Designers.



CONNECTICUT LIGHT AND POWER CO., Norwalk, Conn., United Engineers & Constructors, Engineers and Contractor; Kahn & Jacobs, Consulting Architects.

The Hecht Co.

THE HECHT CO., Hyattsville, Md., Lathrop Douglas, Architect. ▲

PEPSI-COLA BOTTLING WORKS, Quincy, Ill., Hafner & Stranckmeyer, Architects & Engineers. ▼

for colorful walls
that endure . . . specify

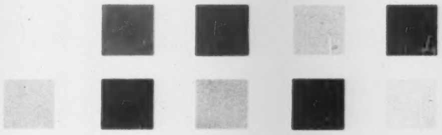
ROBERTSON

PORCELAIN ON ALUMINUM

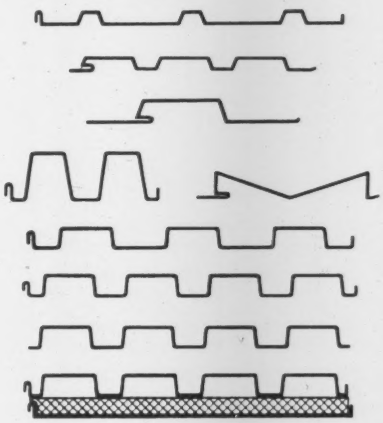
History attests to the fact that the use of porcelain enamel on metal was well known to ancient man. But only in recent years has it come into its own as a practical building material of beauty and permanence for the exterior of modern structures. Now, with a superior base of aluminum, Robertson offers wall panels, spandrels and trim in a wide choice of shapes, textures and fadeproof colors—impervious to the effects of time and weather. Use the coupon to write for literature.

WIDE CHOICE OF COLORS

These are just a few of the almost unlimited number of colors to choose from. Finish is available in three degrees of gloss.



WIDE CHOICE OF SHAPES



. . . USE THIS COUPON TO GET COMPLETE DATA

H. H. ROBERTSON COMPANY

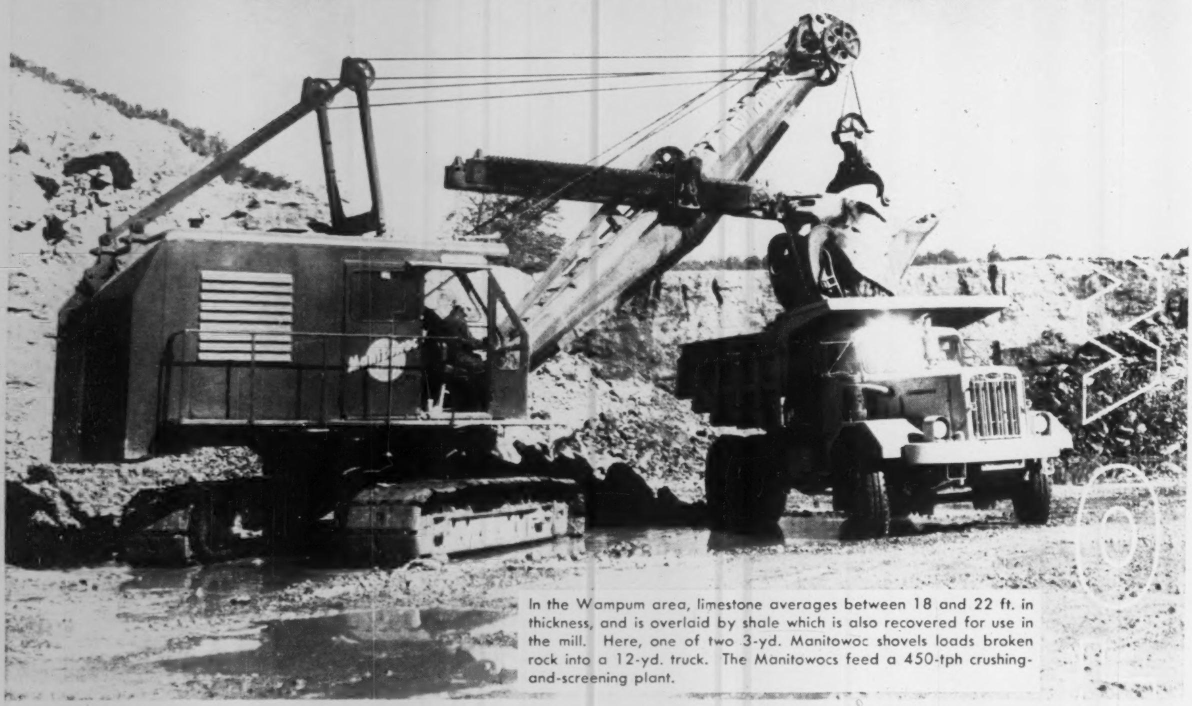
2400 Farmers Bank Bldg., Pittsburgh 22, Pa.
In England—Robertson Thain Ltd., Ellesmere Port, Cheshire
In Canada—Robertson-Irwin Ltd., Hamilton, Ontario
Edmonton, Alberta

NAME____________________ TITLE____________________

COMPANY____

ADDRESS____

PROFITABLE EXPERIENCE *makes major cement producer a Long-Time* MANITOWOC *user*



In the Wampum area, limestone averages between 18 and 22 ft. in thickness, and is overlaid by shale which is also recovered for use in the mill. Here, one of two 3-yd. Manitowoc shovels loads broken rock into a 12-yd. truck. The Manitowocs feed a 450-tph crushing-and-screening plant.

Two more Manitowocs handling loading in company's newest quarry

In equipping a quarry serving its new mill at Wampum, Pa., this well-known cement company chose a pair of 3-yd. Model 3600 shovels to excavate shale and limestone. With a fleet of Manitowoc shovels already operating in other company pits, the choice was a natural one. In location after location, when final operating costs are figured, it's the Manitowoc that's handling more rock at less cost per ton than any other loading equipment.

There are good reasons why a Manitowoc shovel gives this kind of performance. Simplicity of design throughout the machine, with fewer gears, gives a Manitowoc full power at the dipper . . . enables it to cut through the toughest material. Long, widespread crawlers and a massive one-piece carbody provide needed stability for loading rock at a fast, even pace. Air controls and torque converter drive (available for most models) make the entire dig-and-dump cycle as smooth as it is powerful.

These are only the highlights of Manitowoc advantages that make repeat buyers of quarry after quarry. Your Manitowoc distributor will be glad to give you complete details.

Manitowoc

MANITOWOC ENGINEERING CORP.
(A subsidiary of The Manitowoc Company, Inc.)
Manitowoc, Wisconsin

SHOVELS — 1¼ to 6 YDS.   DRAGLINES — 1¼ to 7 YDS.

1-K

←CIRCLE 289 ON READER SERVICE CARD

CIRCLE 290 ON READER SERVICE CARD

Bids—Low Bids—Contracts—Second Section

CALLING FOR BIDS

NEW ENGLAND

HEAVY CONSTRUCTION—BA

† **Conn., Groton**—BA 6/28—Officer in Charge of Constr., U. S. Naval Submarine Base, Box 26, New London, NBy-36348, installation of air-conditioning systems, Bldgs. Nos. 84 and 150. $25,000. CD 9/25/59.

VERMONT—BA 6/30—State Hy. Dpt., State House, Montpelier, ROADS,
East Montpelier—grading, drainage, sub-base 0.872 mi. S.A. Road 1, Montpelier-Maple Four Corners Rd.; beginning approx. 0.872 mi. southerly of East Montpelier-Calais town line extending northerly, Proj. S 0243 (2) SA. Plans deposit $2.50.

MAINE—BA 7/5—State Hy. Comn., Augusta, ROAD,
Somerset Co.—b. conc. road 2.021 mi. Anson. FASP No. S-0230(3).

BUILDINGS—BA

N. H., **Manchester**—BA 7/6—City, Housing Authority, 83 Trahan St., 150 units, HOUSING FOR THE ELDERLY, Massabesic, Summer and Blemont Sts., $600,000. Plans deposit $50. Koehler & Isaak, 1880 Elm St., Manchester; Dirsa & Lampron, 814 Elm St., Manchester; John D. Betley, 944 Elm St., Manchester, archts. CD 8/18/60 and 6/26/59.

HEAVY CONSTRUCTION—LB & CA

Puffer Constr. Corp., 64 Montague Rd., Amherst, Mass., LB **$122,834**, est. $125,000, (19 bidders), Section 1, North WATER TRANSMISSION PIPE LINE, WESTFIELD, MASS. City, Bd. P. Wks., City Hall, Westfield, Mass. BA 6/9. CD 5/24/61;
Roy M. Wright, 876 Bay St., Springfield, Mass., LB **$125,591**, est. $125,000, (19 bidders), Section 2, North WATER TRANSMISSION LINE (Westfield, Mass.).

BUILDINGS—LB & CA

A. J. Martini, Inc., 9 Jerome St., West Medford, Mass., CA Approx. **$550,000**, PLANT and OFFICE near Lechmere Square, EAST CAMBRIDGE, MASS. Federal Liquor, Ltd., 54 Chardon St., Boston, Mass. BA 6/1. CD 5/24/61.

Dwight Bldg. Co., 109 Sanford St., Hamden, Conn., LB Approx. **$500,000**, altering CHURCH, Chapel St., NEW HAVEN, CONN. Trinity-Church-On-The-Green, 53 Wall St., New Haven, Conn. BA 6/8/61. CD 6/2/61.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

D. C., Wash.—BA 6/27—Federal Aviation Agency 16th & Constitution Ave., NW, reinf. conc deck on Observation Terrace, Main Terminal Bldg., Washington National Airport, Inv. 1-3677B1.

NEW JERSEY—BA 7/13—State Hy. Dpt., 1035 Parkway Ave., Trenton, ROADS,
Middlesex Co.—widen, resurf. concrete center barrier 2 mi. Rte. N.J. 18, East Brunswick Twp. between New Jersey Turnpike and Raritan River Railroad, incl. an overpass; widen resurf. concrete center barrier 900 ft. section extending south from Sunset Ave. Madison Twp. CD 4/18/55.

† **N. Y., New York**—BA 7/14—General Services Admin., 250 Hudson St., New York 13, Proj. 00931, BASEMENT alterations and imprvts., U.S. Custom House (old), Bowling Green.

BUILDINGS—BA

Md., Chevy Chase—BA 6/26—Woodward & Lothrop's Department Store, Treasurer's Office, 10 and 11, F and G Sts., N.W., Wash., D.C., 1 story 104,000 sq. ft. steel frame, concrete deck PARKING DECK, at Chevy Chase Store, Wisconsin and Western Aves. Gongwer, Kraas & Webb, 1115 17 St. N.W., Wash., D. C., engrs.

Del., Smyra—BA 6/28—Smyra Special School Dist., Smyra, ELEMENTARY SCHOOL, $600,000. Plans deposit $50. Buchart Assocs., 914 Columbia Ave., Lancaster, Pa. archts. CD 1/10/61.

▲ **Md., Marlboro**—BA 6/29—Prince Georges Co. Bd. Educ., Cooper Lane ELEMENTARY SCHOOL, Landover. Plans deposit $40. Kea & Shaw, 5109 Baltimore Ave., Hyattsville, Md., archts.; Bowie ELEMENTARY SCHOOL, Bowie. Plans deposit $20. Ronald Senseman, 7705 Georgia Ave. N.W., Wash., D.C., archt. CD 12/16/60.

Md., Landover—BA 6/30—Safeway Stores, Inc., Industrial Planning & Constr. Dpt., 425 Madison St., Oakland, Calif., MILK PLANT, Columbia Park Rd. Bonelli & Wong, 580 Market St., San Francisco, Calif., archts.

† **Pa., Lock Haven**—BA 7/17—General Services Admin., 250 Hudson St., New York, 13, N.Y., EXTENSION AND MODERNIZATION U. S. Post Office, Proj. No. 00863.

HEAVY CONSTRUCTION—LB & CA

Pacemaker Constr. Co., Heatherdell Rd., Ardsley 2, N. Y., LB **$534,808**, 85,000 ft. 4 to 12 in. asbestos-cement WATER MAINS, incl. hydrants, valves, etc., Water District 5, NEW WINDSOR (M.D. 14, NEWBURGH), N. Y. Town, Town Hall, Union Ave., New Windsor, N. Y. BA 5/31. CD 5/11/61.

NEW JERSEY—State Hy. Dpt., 1035 Parkway Ave., Trenton, ROADS,
Mal-Bros Contg. Co., Fairfield Ave., West Caldwell, N. J., CA **$572,631**, widening, resurf. 0.649 mi. U. S. Rte. 22, Section 14B, from 900 ft. west of Harding Terrace to Bloy St., Hillside Twp., Union Co. BA 5/18/61. CA 6/14/61. CD 5/26/61, under LB.

BUILDINGS—LB & CA

▲ **The Nicholson Co., Inc.**, 10 Rockefeller Plaza, New York, Zone 20, N. Y., CA Approx. **$1,000,000**, RECEIVING STATION, incl. piling, 8 concrete silos, machinery and barge loading facilities, FLUSHING, N. Y. Marquette Cement Co., 20 N. Wacker St., Chicago, Ill.

▲ **Bureau Constr.**, Bd. of Educ., 42-15 Crescent St., Long Island City, N. Y., rejected bids Mar. 16, general contract PUBLIC SCHOOL 74, 115 St. and 3 Ave., Manhattan Boro, NEW YORK, N. Y. LB $2,032,000. CD 3/20/61, under LB.

† **Aull Constr. Co., Inc.**, 3711 W. Genessee St., Syracuse, N. Y., LB **$154,761**, (2 bidders), 1 story, 52x83 ft. brick veneer TRAINING CENTER; one-bay, 28x47 ft. 4 in. MAINTENANCE SHOP, etc., ENG-30-075-61-115, PENN YAN, N. Y. U. S. Eng., 111 East 16 St., New York 3, N. Y. BA 6/14. CD 5/4/61.

▲ **Michael Riesz & Co., Inc.**, 871 King George Rd., Fords, N. J., LB **$1,042,000**, (3 bidders), Livingston SCHOOL ADDN., Boulevard, BERKELEY HEIGHTS, N. J. Bd. Educ. Union Regional High School Dist., Jonathan Dayton School, Felmer Ave., Springfield, N. J. BA 6/13/61. CD 5/25/61.

Pagano Constr. Co., Inc., 238 Quince St., Vineland, N. J., CA **$531,638**, 2 story, 150x200 masonry and steel NOVITIATE ADDN., NEWFIELD, N. J. Daughters of Mercy, Villa Rosello, Newfield, N. J. CD 3/8/61, under LB.

▲ **Constanza Constr. Co.**, 6515 South Crescent St., Pennsauken, N. J., CA Est. approx. **$1,000,000**, SHOPPING CENTER, PENNSAUKEN, N. J. Government Employees Exchange, Crescent Blvd. and Karaghan Ave., Pennsauken, N. J. BA 6/1/61. CD 6/1/61.

United Engineers & Constructors, Inc., 1401 Arch St., Phila., Pa., CA **$500,000**, mfg. PLANT, conversion former Fort Plant, CHESTER, PA. Reynolds Metals Co., 301 E. Grace St., Richmond, Va. BA 5/15/61. CD 5/15/61.

Badenheusen Corp., Cornwells Heights, Pa., Owner Builds, **$175,000**, SHOP, CORNWELLS HEIGHTS, PA. The Ballinger Co., 1625 Race St., Phila., Pa., archt.

William Graham, 242 Wood St., Doylestown, Pa., CA **$115,000**, AUTO SALES, service and garage, DOYLESTOWN, PA. Raymond Mills, Inc., 15 W. State St., Doylestown, Pa. Stephen B. Hazzard, Warrington, Pa., archt.

▲ **George A. Noew**, Holland, Pa., Owner Builds, **$1,111,000**, RESIDENTIAL DEVELOPMENTS, Holland Road, HOLLAND, PA.

Cottman Builders Supply Co., 100 W. Cookland St., Phila, Pa., Owner builds **$400,000**, 30 RESIDENTIAL DEVELOPMENTS, Summerdale Ave., PHILA, PA. Sheldon A. Keast, 1211 Chestnut St., Phila, Pa., engr.

Fredavid Constr. Co., 524 E. Roosevelt Blvd, Phila, Pa., Owner builds **$500,000**, 6 APARTMENTS, 72 units, Domino Lane, PHILA, PA. Henry S. Berg, 1411 Walnut St., Phila, Pa., archt.

Hartel Homes, Inc., 100 W. Rockland St., Phila, Pa, Owner builds **$500,000**, 36 RESIDENTIAL DEVELOPMENTS, PHILA, PA.

▲ **Heyward Robinson Engineering Co., Inc.**, 114 Liberty St., New York City, N. Y., CA **$1,200,000**, multi-level PARKING GARAGE, Juniper St., PHILA, PA. Penny-Pack Systems, Inc., 80 Wall St., New York City, N. Y.

Knollwood Apts. Inc., c/o Lowell Gable, Paoli, Pa, Owner builds over **$400,000**, 10 APARTMENTS, 8 units, Nutt Rd., PHOENIXVILLE, PA. Francis Jobson, Wayne, Pa., archt.

Lawrence A. Buck, North Wales, Pa., CA **$522,569**, 1 story, masonry and steel, 122 x 254 ft. HOME FOR THE AGED, SELLERSVILLE, PA. Lutheran Congregation in Upper Penn Valley, Sellersville, Pa. BA 4/19/61. CD 4/28/61 under LB.

Cedarbrook Bldg. Co., Willow Grove, Pa., Owner builds **$40,000**, RESIDENTIAL DEVELOPMENT, WILLOW GROVE, PA.

Gilles Cotting Inc., 1057 W. Broad St., Falls Church, Va. LB **$146,771**, (8 bidders) addition to LAUNDRY BLDG., D. C. Village, Blue Plains, SW WASH., D. C. D. C. Govt. Bldgs. & Grounds, 499 Pennsylvania Ave., NW, Wash., D. C. BA 6/13/61. CD 5/18/61.

William P. Lipscomb Co., Inc., Washington Bldg., Wash. D. C., CA est. $400,000, 3 story CLUB EXTENSION, WASH., D. C. Cosmos Club, 2121 Massachusetts Ave., NW, Wash. D. C., CA 6/9/61. CD 11/30/60.

▲ **Duncan Village**, 909 Greenbank Rd. Wilmington, Del. Owner Builds, **$2,000,000**. RESIDENTIAL DEVELOPMENT (132) Greenbank and Duncan Roads, WILMINGTON, DEL.

SOUTH

HEAVY CONSTRUCTION—BA

† **Fla., Jacksonville**—BA 6/26—Officer in Charge of Construction, Jacksonville Naval Air Station, rehabilitation of Townsend Bomb Target (McIntosh County, Georgia) grade 3 mi. of access rd. cemerator bldg., pumphouse, sewer water, electric, Jacksonville Naval Air Station, NBy-34565, Spec. 34565/61. $10,000-$25,000. CD 12/26/50.

† **Fla., Jacksonville**—BA 6/26—Officer in Charge of Construction, Jacksonville Naval Air Station, modernization of the CO2 Fire Protection System, overhaul and repair department, Jacksonville Naval Air Station, NBy-37767, Spec. 37767/61. $10,000-$25,000. CD 12/26/50.

† **Va., Norfolk**—BA 6/26—Officer in Charge of Constr., Bldg. A-68, U. S. Naval P. Wks. Center, Norfolk, Zone 11, REPLACEMENT of ROOF BLDG. G-29, Naval Air Station, NBy 37001. $10,000.

† **Va., Norfolk**—BA 6/26—Officer in Charge of Constr., Bldg. A-68, U. S. Naval P. Wks. Center, Norfolk, Zone 11, REPLACEMENT of ROOFS, VARIOUS BLDGS., Naval Air Station, NBy 36929. $25,000.

† **Fla., Jacksonville**—BA 6/27—Officer in Charge of Construction, Jacksonville Naval Air Station, MEZZANINE DECKS for Hangar No. 67, Cecil Field, NBy-37766, Spec. 37766/61. $10,000-$25,000. CD 12/26/50.

† **Fla., Orlando**—BA 6/27—Base Procurement Office, McCoy Air Force Base, Duplicate WEATHER FACILITY, McCoy Air Force Base, IFB-08-617-61-75. CD 9/24/58.

† **Fla., Cocoa**—BA 6/28—Procurement Office, Air Force Missile Test Center, Patrick Air Force Base, POWER OUTLETS in fuel storage area, Cape Canaveral, IFB-08-606-61-228. $25,000. CD 10/6/60.

Louisiana—BA 6/28—State Bd. Comrs., Gravity Drainage Dist., No. 2, American Legion Community House, Newellton, La., DRAINAGE CANALS, CLEARING and SNAGGING 27.87 mi. Gravity Drainage Dist. No. 2, St. Joseph, Tensas Parish.

† **Va., Newport News**—BA 6/28—Federal Aviation Agency, New York International Airport, Jamaica, N. Y., INSTRUMENT LANDING SYSTEM LOCALIZER FACILITY, Patrick Henry Airport, IFB-1-61-213B1.

Ky., Lexington—BA 6/30—City, City Hall, 272,000 g.p.d. Gainesway SEWAGE TREATMENT PLANT. Over $88,000. Plans deposit $35. J. Stephen Watkins, 446 East High St., Lexington, Ky., engr. CD 10/10/60.

† **Fla., Cocoa**—BA 7/3—Procurement Office, Air Force Missile Test Center, Patrick Air Force Base, Gasoline DISPENSING FACILITY, Port Canaveral, IFB-08-606-61-231. $25,000. CD 10/6/60.

† **Virginia**—BA 7/10—Southside Soil Conservation Dist., c/o W. F. Vaughan, Keysville, ROANOKE CREEK WATERSHED DAM, Sites 3 and 4 for Soil Conservation Service. CD 10/22/59.

▲† **Fla., Cocoa**—BA About 7/13—U. S. Eng., P.O. Box 4970, Jacksonville Zone 1, constr. POLARIS CLASS No. 9 FACILITIES, Cape Canaveral Missile Test Annex, Air Force Missile Test Center, Patrick Air Force Base, ENG-08-123-61-95. $1,500,000. CD 10/6/60.

† **Ga., Albany** — BA 7/14 — Base Procurement Office, Turner Air Force Base, rehabilitation of WHERRY HOUSING, Turner Air Force Base, IFB-09-620-61-66. CD 9/9/60.

† **West Virginia**—BA 7/18—U. S. Eng., 502 8th St., Huntington, W. Va., LOCAL PROTECTION PROJECT, Williamson, CIVENG-46-022-61-70B. CD 10/3/60.

BUILDINGS—BA

La., Lake Charles—BA 6/22—McNeese State College, Science Bldg., Lake Charles, four-2 story 24 x 168 ft. brick and concrete STUDENT FAMILY HOUSING. $450,000. Plans deposit $50. Dunn & Quinn, 1735 Ryan St., Lake Charles, La., engrs. CD 2/1/56.

Va., Norfolk—BA 6/23—Norfolk & Western Railway Co., 8 North Jefferson St., Roanoke, 1 story, 75 x 152 ft. masonry, steel CAR REPAIR BLDG. CD 12/5/60.

HEAVY CONSTRUCTION—LB & CA

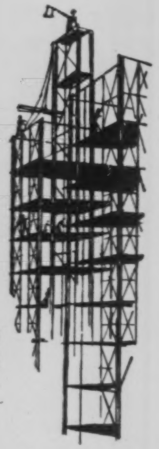
▲ **FLORIDA**—State Road Dpt., **Tallahassee**, ROADS,
C. T. Stockton, Inc., Box 1235, Hialeah, Fla., CA **$1,380,845**, constructing 4-lane divided facility, grading, limerock base, Type I b. conc. surf. course, binder, 120 ft. dual bridge conc. slab deck, prestressed conc. beams on prestressed conc. pile bents, approx. 7.993 mi., between Vero Beach and Wabasso, Federal Aid Proj. No. F-003-4(23) (Job No. 88010-3208), SR 5, Indian River Co. BA 5/30/61. CA 6/13/61. CD 6/2/61, under LB.

BUILDINGS—LB & CA

▲ **J. M. Turner & Co., Inc.**, 317 McClanahan St. S.W., Box 1848, Roanoke, Va., LB **$1,085,000** (5 bidders), DINING HALL, Virginia Polytechnic Institute, BLACKSBURG, VA. Virginia Dpt. Educ., State Office Bldg., Richmond, Va. BA 6/8/61. CD 5/17/61.

▲ **Hewmont Constr. Co.**, Culloden, W. Va., CA **$1,137,284** (6 bidders), DUPONT HIGH SCHOOL, near Belle, CHARLESTON, W. VA. The Kanawha Co. Bd. Educ., Courthouse, Charleston, W. Va. BA 6/8/61. CD 5/17/61.

O'Neill-Dunham Inc., P.O. Box 7507, Station C, Atlanta, Ga., CA **$453,807**, CHURCH EDUCATIONAL CHAPEL., ATLANTA, GA., Lutheran Church of the Redeemer, 731 Peachtree St., NE Atlanta, Ga. BA 5/4/61. CD 5/10/61 under LB.



He can't DO what you want ...if he can't HEAR what you SAY! No need to scream your head off uselessly! With Audio Hailer you can project *spoken* commands . . . *like a harpoon* . . . over a half-mile range . . . in any direction!

Yet you are *not* "tied down" to any external power source. New "TP" (transistor-powered) Hailer is a compact, 5¾ lb., "one-piece" unit, self-powered on standard flashlight cells.

AUDIO "TP" HAILER®
transistor-powered
PORTABLE MEGAPHONE

Save your voice . . . your time . . . your temper! Mail coupon for full description and price list.

AUDIO EQUIPMENT CO., INC.
P.O. Box 192, Port Washington 53, N. Y.

Rush Audio "TP" Hailer catalog and prices

Name__________________ Title__________
Company ________________________
St. & No.________________________
City or Town________________________
Zone (if any)________ State____________

CIRCLE 292 ON READER SERVICE CARD

Hoefle Constr. Co., 8130 Biscayne Blvd. Miami Fla., CA **$130,000**, Miami JAI ALAI FRONTON alterations and addns., 3500 N.W. 37th Ave., MIAMI, FLA. The Hub Amusement Corp., 3500 N.W. 37th Ave., Miami, Fla. BA 5/31/61. CD 6/7/61, under LB.

Hunter & Tschirgi, 205 Worth Ave., Palm Beach, Fla., LB **$720,000**, (1 bidder) Junior HIGH SCHOOL "T", Garden Blvd., Palm Beach Gardens, PALM BEACH, FLA. Palm Beach County Bd. Pub. Instruction, Palm Beach, Fla. BA 6/7/61 CD 5/29/61.

† **S. J. Cohen Co.**, Blytheville, Ark., CA **$308,949**, McKinney Bayou PUMPING STATION and appurtenances, Tunica Co., MISSISSIPPI. U. S. Eng., P.O. Box 60, Vicksburg, Miss. BA 5/25. CD 5/10/61.

B. Z. Howell Sons Constr. Co., Box 158, Philadelphia, Miss.. CA **$592,292** HIGH SCHOOL, LOUISVILLE, MISS. Bd. Trustees Louisville Separate Municipal School Dist., Louisville, Miss. BA 5/3 CD 5/23/61 under LB.

Mayor & Board, Bunkie, La., rejected bids May 29, Proj. 2, COLLECTION SYS. alterations and addns.; Proj. 1, SEWAGE TREATMENT PLANT, BUNKIE, LA. LB $320,332, Proj. 2; LB $231,048, Proj. 1. Will re-advertise. CD 6/7/61, under LB.

▲ **United Engineers & Constructors, Inc.**, 1401 Arch St., Phila., Pa., CA est. **$15,000,000**, 25 m.g. per year METHANOL PLANT and 50 m. lbs. per year VINYL ACETATE MONOMER PLANT, GEISMAR, LA. Borden Chemical Co., 350 Madison Ave., New York 17, N. Y:

▲ **J. B. Talley & Co.**, St. Martinsville, La., LB **$1,199,000** Parish General HOSPITAL, HOUMA, LA. Terrebonne Parish Police Jury, Courthouse Bldg., Homma, La. Ba 6/13 CD 6/31/61.

▲ **Johnson, Drake & Piper, Inc.**, 2244 Holcombe Blvd., Houston, Tex., LB **$2,583,000**, 5 story rein.-con., masonry CLINIC, Jefferson Parish, METAIRIE, LA. Ochsner Foundation Hospital, 3503 Prytaina St., New Orleans, La. Ellerbe & Co., Sibley St., St. Paul, Minn., archts.

† **Appalachian Contg. Co.**, Robbinsville, N. C., LB **$356,000**, est. $500,650 (3 bidders), Contr. 1, CLEARING POOL, Markland Locks and Dam, Indiana side Ohio River, Carroll Co., CIVENG-15-029-61-43, KENTUCKY, OHIO and INDIANA. U. S. Eng., P.O. Box 59, Louisville, Ky. BA 6/13. CD 5/26/61.
Clearline Corp., Cambridge City, Ind., LB **$217,535**, est. $543,600 (3 bidders), Contr. II, CLEARING POOL, Markland Locks and Dam, Kentucky side Ohio River (Kentucky, Ohio and Indiana).

Laurel Constr. Co., 300 12 Ave. S., Nashville, Tenn., LB **$962,400** (8 bidders) SCHOOL, CADIZ, KY. Trigg Co. School Bd., Cadiz, Ky. CD 7/20/60.

▲ **Inter-State 65 Corp.** Dixie Hy., Louisville, Ky., Owner Builds **$1,400,000**, 147-room MOTEL, Gaulbert and Arthur Sts., LOUISVILLE, KY.

▲ **TENNESSEE**—State Hy. Dpt., Nashville, ROADS
Tenn.—**Clyde E. Martin**, Smithville, Tenn., CA **$623,832**, grading, drainage and paving with crushed stone and bit. materials (plant mix) near Holston Ordnance Works, 2.643 mi. Proj. No. F-001-9(30), Hawkins-Sullivan Counties;
Tenn.—**Oman Constr. Co., Inc.**, Acklen Park, Nashville, Tenn., CA **$1,774,461**, grading, drainage, pave, with crushed stone and bit. materials (plant mix) and four bridges, 3.804 mi. Proj. No. U-034-3(2), Sullivan Co.;

Tenn.—**Mid-Tenn Paving Co.**, Robertson Rd., Nashville, Tenn., CA **$745,816**, constr. of crushed stone base with bit. (plant mix) surf. sect. Interstate Rte. No. 40, 5.978 mi. Proj. No. I-40-3(38)179, Williamson-Cheatham Counties. Grand total $3,164,636. BA 5/26/61. CD 6/1/61, under LB.

† **U. S. Property & Fiscal Office for Tennessee**, Vultee Blvd., Nashville, Tenn., rejected bids May 25, organizational maintenance SHOP for Tennessee National Guard, ENG-40-098-61-11, COLUMBIA, TENN. CD 5/19/61.

Armstrong Constr. Co., 151 Shelby St., Kingsport, Tenn., CA **$527,000**, OFFICES AND COURTHOUSE, KINGSPORT, TENN. City, City Hall, Kingsport, Tenn. BA 6/6/61. CD 6/14/61. under LB.

▲† **Smith & Turley, Inc.**, 1955 Poplar Ave., Memphis, Tenn., CA **$3,800,000**, 250 units CAPEHART HOUSING, U. S. Naval Air Station, NBy 37680, MEMPHIS, TENN. Dist. P. Wks. Office, 6th. Naval Dist., Blg. 13, U. S. Naval Base, Charleston, S. C. BA 6/2/61. CD 6/7/61, under LB.

Carl Batson, Constr. Co., 933 Woodmont Blvd., Nashville Tenn., CA **$500,000**, 42 unit APARTMENT, NASHVILLE, TENN. Chateau Apartments Co., 2000 21st. Ave., S. Nashville, Tenn.

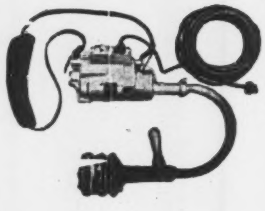
MIDDLE WEST

HEAVY CONSTRUCTION—BA

† **Illinois**—BA About 7/11—U. S. Eng., 536 S. Clark St., Chicago, Ill., NIKE HERCULES FACILITIES, SITE C 93, Chicago Defense Area, incl. two 1 story, 3,000 sq. ft. masonry structures with utilities; one HIPAR STEEL TOWER; two RADAR TOWERS, electrical work, double bit. surf. treated pavement addns., concrete walks and pad, fencing, grading, seeding, ENG-11-032-61-91. $200,000. Plans deposit $10.

Mich., Detroit—BA 7/11—At office city engr., 528 City-County Bldg., Zone 26, RELIEF SEWER ARM, Curtis Ave. from James Couzens Hy. to west of Steel Ave. Plans deposit $10. CD 2/24/59.

"BERG"
CONCRETE SURFACER
MODEL A



"BERG" equipment is used extensively for surfacing and finishing applications on concrete construction.

The many "BERG" Models available permit exact selection for your particular application.

The distinctive "BERG" features give you the kind of results that are realized in better quality work, combined with lower costs.

"BERG" Heads and Attachments are interchangeable, thereby providing adaptability for vibrating, wire brushing, sanding and polishing applications.

THE CONCRETE SURFACING MACHINERY CO.
4667 SPRING GROVE AVE.
CINCINNATI 32, OHIO

CIRCLE 64 ON READER SERVICE CARD

"NEITHER RAIN NOR SNOW NOR DARK OF NIGHT . . . ."

But often forgetting the postal zone number when you address an envelope can delay your letter long enough to miss the appointed round. There are 106 cities in America where a complete address includes a zone number. Always use it when writing to or from these cities.

BUILDINGS—BA

Ill., West Chicago—BA 7/6—Elementary School Dist. No. 33, Joliet & Forest Ave., Junior HIGH SCHOOL. $975,000. Frazier Raferty Orr & Fairbank, Geneva, archts. CD 5/35/61.

Ill., Ottawa—BA 7/14—Pleasant View Lutheran Home, Ottawa, brick, concrete HOME FOR AGED ADDN. $670,000. O. H. Thorson, Winter Ridge Rd., Castle Hill, Waterloo, Iowa, archt. Harold E. Rucks, 1471 Dodge, Dubuque, Iowa, engr. CD 1/22/60.

HEAVY CONSTRUCTION—LB & CA

Tillar Bros., Inc., 90 Laurel St., Cincinnati, O., LB **$118,993** (4 bidders), CONTROL TOWER, Lunken Airport, CINCINNATI, O. City, City Hall, Cincinnati, O. BA 5/31/61. CD 4/12/60.

Galier Bros., Inc., 4106 Mayfield Rd., Cleveland 21, O., CA **$351,922**, est. $370,000 (8 bidders), PAVING north marginal roadway from E. 9th to E. 40th, and E. 9th from Shoreway to Erieside Ave., CLEVELAND, O. City, City Hall, Cleveland 14, O. BA 6/1/61. CD 5/29/61.

Earth Constr. & Engineering Co., 3333 Engle Rd., Fort Wayne, Ind., LB **$341,950**, est. $350,000 (4 bidders), SANITARY RELIEF SEWERS, FORT WAYNE, IND. City, City Hall, Fort Wayne, Ind. BA 6/9/61. CD 5/18/61.

City, City Hall, Bloomington, Ill., rejected bids May 2, 12 in. WATER MAIN W. Washington St. with 10 in. loop west of G.M. & O.R.R. tracks, BLOOMINGTON, ILL. LB $98,752. Will re-advertise. CD 5/25/61, under LB.

Canton Contractors, Canton, Ill., LB **$109,367**, ROAD SURFACING, crushed stone, Proj. 106 TR, 104 TR; 104-1TR, CANTON, ILL. Fulton County, Courthouse, Canton, Ill. BA 5/29/61.

▲† **H. S. Kaiser Co.**, 3344 W. Franklin Blvd., Chicago, Ill., CA **$3,664,000**, AIR CONDITIONING, Main Post Office, CHICAGO, ILL. General Services Admin., 219 S. Clark St., Chicago 4, Ill. BA 4/17/61. CD 4/19/61, under LB.

Parkhill-Mitchell Corp., East St. Louis, Ill., LB **$94,229**, est. $132,000 (6 bidders), WATER-WORKS, PUMPING STATION, FILTRATION PLANT, MAINS, OAKWOOD, ILL. Village, Village Hall, Oakwood, Ill. BA 6/5/61. CD 5/31/61.

J. P. Wetherby Constr. Corp., 1016 W. Superior St., P.O. Box 24, Ottawa, Ill., LB **$127,676**, ROAD PAVING, crushed stone, Type B, Proj. 84-G-MFT, OTTAWA, ILL. Bd. Comrs. La Salle Co., Courthouse, Ottawa, Ill. BA 6/5/61. CD 10/17/60.

BUILDINGS—LB & CA

Leo W. Schmidt Co., 9920 Granger Rd., Cleveland 25, O., CA **$202,000**, 21,000 sq. ft. WAREHOUSE at 2141 Broadway, CLEVELAND, O. Jos. Schlitz Brewing Co., 238 W. Galena, Milwaukee, Wis. John & Thomas Bruecker, 4869 N. Elkhart Ave., Milwaukee 17, Wis., archts.

▲† **Kay Cee Constr. Co.**, 8115 Ridgeway St., Skokie, Ill., CA **$2,098,700**, BOILER PLANT, DISTRIBUTION SYSTEM, ELEVATORS, CONNECTING CORRIDORS, Veterans Admin. Center, DAYTON, O. Veterans Admin., Munition Bldg., Washington, D. C. BA 5/23/61. CD 5/29/61, under LB.

United States Steel Corp., American Bridge Division, 629 2nd St. S.E., Minneapolis, Zone 14, Minn., CA est. over **$400,000**, fabrication and erection, struc. steel, 13 story, 450,000 sq. ft., for Memorial LIBRARY, SOUTH BEND, IND. University of Notre Dame, South Bend, Ind. BA 4/12/61. CD 3/31/61.

Dye Steel Builders, 2300 N. 12th St., Quincy, Ill., CA Est. **$110,000**, 144,000 bushel CORN STORAGE, ALPHA, ILL. Norman Manufacturing Co., Alpha, Ill.

Griffiths Constr. Corp., 3015 W. 147th St., Posen, Ill., CA **$700,000**, 4 story MOTEL, OFFICE, swimming pool, Park area, 5837 Harlem Ave., CHICAGO, ILL. Package Structures, Inc., 10 S. La Salle St., Chicago, Zone 3, Ill. Eugene Meyer, 3034 W. Devon Ave., Chicago, Ill., archt.

Alan Constr. Co., 836 Skokie Blvd., Northbrook, Ill., CA **$135,000**, 75 x 154 ft. FACTORY OFFICE, 5559-91st N. Lynch St., CHICAGO, ILL. Magne Craft Electric Co., 3352 W. Grand Ave., Chicago, Ill. A. Epstein & Son, Inc., 201 Pershing Rd., Chicago, Ill., archt.

▲ **George Sollitt Constr. Co.**, 109 N. Dearborn St., Chicago, Zone 2, Ill., CA **$1,500,000**, 95 units APARTMENTS, 1400 North State Parkway, CHICAGO, ILL. Marvin M. Romanek, 1033 W. North Shore Ave., Chicago, Ill. Hausner & Macsai, 104 S. Michigan Ave., Chicago, Zone 3, Ill., archts.

Goldman Constr. Co., 5757 Woodlawn Ave., Chicago, Ill., CA **$441,000**, 18 unit row HOUSES, 1301-35 E. 55th St., CHICAGO, ILL. Webb & Knapp, Inc., 5757 S. Woodlawn Ave., Chicago, Ill. Harry Weese & Assocs., 104 S. Michigan Ave., Chicago 3, Ill., archt.

L. Korinek & Son, 1005 W. Clay St., Collinsville, Ill., LB **$719,623**, North JUNIOR HIGH SCHOOL, COLLINSVILLE, ILL. School Dist. No. 10, Collinsville, Ill. BA 6/2/61. CD 5/19/61.

Chas. D. Smith & Son, Hy. 23, Fond du Lac, Wis., CA Est. **$500,000**, 1 story, bsmnt., 162 x 168 ft. WAREHOUSE, WEST BEND, WIS. Gehl Bros., 143 Water St., West Bend, Wis. BA 6/8/61. CD 5/29/61.

MISSISSIPPI TO ROCKIES

HEAVY CONSTRUCTION—BA

† **South Dakota**—BA 7/6—U. S. Eng., 215 N. 17th St., Omaha, Neb., 22,200 ft. wood post and board snow fence, Milwaukee RAILROAD RELOCATION, Glenham to Mobridge, Oahe Dam Proj., ENG-25-066-61-139, $50,000. Plans deposit $1. CD 9/30/60.

▲ **Tex., San Angelo**—BA 7/6—Shannon West Texas Memorial Hospital, 9 S. Magdalen St., 5 story, masonry HOSPITAL, **$2,100,000**, CD 6/7/61; boiler and laundry plant, **$95,500**, CD 6/15/61. Extended date. Thomas, Jameson & Merrill, 820 N. Harwood St., Dallas, archts engrs. Tippett & Gee, 1333 N. 2nd. St., Abilene, engrs.

† **Colorado**—BA 7/7—National Park Service, Dpt. Interior, Regional Director, Region 2, 307 Federal Bldg., Omaha 2, Neb., water intake and filter, Headquarters Area, Colorado National Monument, Grand Junction, NM-Colo 3142. CD 9/21/59.

† **Okla., Oklahoma City**—BA About 7/18—U. S. Eng., Box 61, Tulsa, DORMITORIES and DINING HALL REVISIONS, incl. mechanical and electrical work, installing exhaust fans, expansion joints on pumps and bleed-off line to cooling towers, Tinker Air Force Base, ENG 34-066-61-71, under $25,000. CD 7/26/61.

HEAVY CONSTRUCTION—LB & CA

▲† **Nolan Bros., Inc.**, Builders Exchange Bldg., Minneapolis, Minn., LB **$1,324,723** (6 bidders) LOCAL FLOOD PROTECTION PROJ., Stage I, right bank of Mississippi River near Chester St., St. Paul. CIVENG-21-018-61-32 MINNESOTA. U. S. Eng., 1217 U. S. Post Office and Custom House, St. Paul 1, Minn. BA 6/13 CD 5/24/61.

C. O. Solberg Co., Inver Grove, St. Paul, Minn., LB **$281,566** (6 bidders) STREET IMPRV. PROJ. 7 mi., ST. PAUL PARK, MINN. Village, Village Hall, St. Paul Park, Minn. BA 6/12. CD 5/26/61.

Griffin Pipe Division, 2601-9th Ave., Council Bluffs, Iowa, LB **$88,281**, WATER PIPE, COUNCIL BLUFFS, IOWA. City, City Hall, Council Bluffs, Iowa. BA 5/31/61. CD 5/24/61.

† **Paul Moody Constr. Co.**, Box 377, Pauls Valley, Okla. LB **$150,119**, (4 bidders) three FLOODWATER RETARDING STRUCTURES, Bear Fall and Coon Creeks Watershed, Sites Nos. 14, 24 and 25, Logan Co. OKLAHOMA. Bear, Fall & Coon Creeks Water & Soil Conservancy, Dist. No. 4, Federal Bldg., Guthrie, Okla. BA 6/9/61. CD 6/2/61.

Simms Inc., Box 829, Duncan, Okla., LB **$97,595** (4 bidders) two FLOODWATER RETARDING STRUC-

FOR MAXIMUM MANEUVERABILITY

The rubber tired MAXI crane carrier—for upper works rated for 12 to 60 ton capacity—steers easier—turns sharper—travels faster in both forward and reverse! Single operator control of load and transmission, less shock and vibration, protection of road and yard surfaces, 25% more load capacity, easier maintenance—just a few of the many reasons you should specify MAXI for your cranes or excavators. For complete details write . . .

MAXI
Division of
Crane Carrier Corp.

Write: Wendell Barber
P.O. Box 5008, Tulsa, Oklahoma
Dial: LUther 3-5133

TURES, Rock Creek, Sites Nos. 13 and 14, Washita River Watershed, Murray and Pontotoc Counties OKLAHOMA Soil Conservation Service, State Office, Stillwater, Okla. BA 6/9/61. CD 5/25/61.

Austin Paving Co., 5903 Danbury Drive, Austin, Tex., LB **$629,324**, STREET PAVING Bruton Road from 2nd. Ave. to Jim Miller Road, DALLAS, TEX. City, City Hall, Dallas, Tex. BA 6/12/61. CD 12/5/58.

City, Dpt. Pub. Wks., City Hall, Denton, Tex, Owner builds **$90,000**, c.i. WATER LINES, repairing, DENTON, TEX. CD 2/25/60.

City, Dpt. Pub. Wks., City Hall, Denton, Tex., Owner builds **$125,000**, vit. clay SANITARY SEWER repairing, replacement, DENTON, TEX. CD 2/25/60.

Trotti Thompson, 390 S 4th. St, Beaumont, Tex., LB **$207,218** (3 bidders) hot-mix asphalt STREET SURF., water lines, sewers, PORTNECHES, TEX. City, City Hall, Port Neches, Tex. BA 6/9/61. CD 12/10/60.

† **G & W Constr. Co.**, P.O. Box 5141, Wichita Falls, Tex., LB **$107,591**, est. $152,650 (4 bidders) GROUND CONTROL INTERCEPT. at Perrin Air Force Base, ENG-41-443-61-54, SHERMAN, TEX. U. S. Eng., 100 West Vickery, Fort Worth, Tex. BA 6/13/61. CD 5/17/61.

Englewood Constr. Co., 2170 West Union, Englewood, Colo., LB **$211,397**, (8 bidders) 21,000 lin. ft. of 18 in. WATER MAIN, DENVER, COLO., South Gate Water Dist., 3470 South Sherman St., Denver, Colo. BA 6/8/61. CD 5/29/61.

Winslow Constr. Co., 3002 South Huron, Englewood, Colo., LB **$270,585**, est. $100,000, (5 bidders) Outfall SEWER (Phase 1), 17,400 lin. ft. of 10 in. to 30 in. GRAVITY LINE, DENVER, COLO. South Gate Sanitation Dist., 3470 South Sherman St., Denver, Colo. BA 6/8/61. CD 5/29/61.
Dougan Constr. Co., 110 West 13th Ave., Denver, Colo., LB **$103,900**, (7 bidders) SEWAGE LIFT STATION, (Denver, Colo.)

BUILDINGS—LB & CA

▲ **J. A. Jones Constr. Co.**, 133 Ellis, NE, Atlanta, Ga., CA **$5,500,000**, 10 story, 300 unit MOTOR HOTEL, underground parking, DALLAS, TEX. Sarne-Mallin Interests, c/o Herman Blum, engr., 4930 Maple St., Dallas, Tex.

Bema Constr. Co., 6539 S. Park St., Houston, Tex., Owner builds **$625,000;** ($400,000 1st. year) one ½ years to complete, 40 DWELLINGS, Sec. 2-A, Songwood Addn., HOUSTON, TEX.

H & A Building Co., N. Esperson Bldg., Houston, Tex, Owner builds **$448,000**, 24 DWELLINGS, North Shore of Clear Lake, HOUSTON, TEX.

▲ **Wright Constr. Co.**, c/o Frank Sharp, Oak Forest State Bank Bldg., Houston, Tex., Owner builds **$3,600,000;** ($1,250,000 1st. year) 2½ years to complete, 200 DWELLINGS, Country Club Terrace in Sharpstown area, HOUSTON, TEX.

Charles Lehne, P.O. Box 1882, Midland, Tex., Owner builds **$428 000**, STORES, MIDLAND, TEX. Pierce, Norris, Pace & Associates, 1102 W. Wall St., Midland, Tex., archts.

H. H. Moeller, P.O. Box 11035, San Antonio, Tex., LB **$705,000**, est. $550,000 (11 bidders) 70 bed, 1 and 2 story, masonry, A/C HOME FOR AGED, NEW BRAUNFELS, TEX. Eden Home for the Aged, Inc., 631 Lakeview St., New Braunfels, Tex. BA 6/6/61. CD 5/25/61.

Winston Constr. Co., 2335 Vance-Jackson Rd., San Antonio, Tex., Owner builds **$433,150**, 26 DWELLINGS, SAN ANTONIO, TEX.

▲† **Henry George & Son**, Hutton Blvd., Spokane, Wash., LB **$3,975,000**, (9 bidders), HOSPITAL, FORT HARRISON, MONT. Veterans Administration, Munitions Bldg., Wash., D. C. BA 6/13/61. CD 5/4/61.

▲† **Gale A. Goodwin & Assocs.**, 724 Quincy St., Rapid City, S. D., CA **$1,622,153**, est. $1,650,000, 100-CAPEHART HOMES, Warren Air Force Base, CHEYENNE, WYO. Base Procurement Office, Warren Air Force Base, Cheyenne, Wyo. BA 5/25/61. CD 5/29/61 under LB.

FAR WEST

BUILDINGS—BA

† **Washington**—BA 7/6—U. S. Forest Service, 729 N.E. Oregon St., Portland, Ore., Contract R6-62-2, two RESIDENCES, Tieton Ranger Station.

▲ **Calif., Los Angeles**—BA 7/11—Bd. Educ., 1425 S. San Pedro St., Carson HIGH SCHOOL, 22328 S. Main St., Torrance. $4,300,000. Austin, Field & Fry, 2311 W. 3 St., Los Angeles, Calif., archts. CD 12/23/59.

HEAVY CONSTRUCTION—LB & CA

† **H & K Constructors**, Box 2125, Anchorage, Alaska, LB **$435,247**, est. $466,828, (9 bidders), Airmen's DORMITORIES alterations, Fire Island and King Salmon Air Force Stations, Inv. 61-50, ALASKA. U. S. Eng., P.O. Box 7002, Anchorage, Alaska. BA 6/9. CD 5/10/61

† **IDAHO**—Bureau P. Rds., Dpt. Commerce, 914 West Jefferson, Boise, Bids opened 6/9, ROADS,
Idaho—**Earl L. McNutt Co.**, 351½ East Broadway, Eugene, Ore., LB **$561,095**, (5 bidders), constr roadway, drainage structures, asp. surf. 9.145 mi Reynolds Pass Hy., Targhee National Forest, Proj 35-a, Fremont Co.;
Idaho—**V. Burgramm Co.**, Idaho Falls, Idaho, LB **$209,285**, (4 bidders), constr. 13.490 mi. plant mix bit surf. on Yellowstone Park Hy., Targhee National Forest, Proj. 34-2(1), Fremont Co. CD 5/26/61.

† **Nev., Fallon**—BA 6/28—Dist. Pub. Wks. Office, 12th Naval Dist., Room C 112, San Bruno, Calif., JET ENGINE RUN-UP STAND, Naval Auxiliary Air Station, NBy-36089, Spec. No. 36089/61, $25,000-$100,000. CD 9/17/57.

† **Barnhardt & Platt**, Box 27, Salem, Ore., LB **$77,380**, est. $71,118, (3 bidders), RECREATION FACILITIES, Fern Ridge, Lookout Point and Dorena Reservoirs, CIVENG-35-026-61-170, OREGON. U. S. Eng., Pittock Block, Portland, Ore. BA 6/12/61. CD 5/25/61.

Martin Constr. Co., Box 482, Lake Oswego, Ore., LB **$142,529**, (4 bidders), SEWAGE TREATMENT PLANT EXPANSION, SEASIDE, ORE. City, City Hall, Seaside, Ore. BA 6/5/61. CD 5/18/61.

CALIFORNIA—State Div. Hys., 1120 N St., Sacramento, Bids opened 6/7, ROAD,
Marlin Tryon, P.O. Box 126, Bridgeville, Calif., LB **$92,483**, (7 bidders), channel revisions and realignment State Sign Rte. 36 between 9.7 mi. and 10 mi. east of US Hy. 101 near Carlotta, Humboldt Co. CD 5/12/61

† **U. S. Eng.**, 180 New Montgomery St., San Francisco, Calif., cancelled bids to have been opened June 21, CLEARING 250 ft. CHANNEL, Russian River, Mendocino Co. CIVENG-04-203-61-17, CALIFORNIA. CD 5/8/61.

Guy F. Atkinson Co., Box 259, Long Beach, Calif., CA **$934,450**, est. $1,000,000, Proj. 644, WHARF, Pier A, Berths 205, 206, 207, Outer Harbor, LONG BEACH, CALIF. Long Beach Harbor Dpt., 925 Harbor Plaza, Long Beach, Calif. BA 6/7. CA 6/12. CD 6/13/61, under LB.

Pacific Allied, 7605 Wheatland Ave., Sun Valley, Calif., CA **$568,237**, Bell CREEK, Shoup Ave. to Fallbrook Ave and Dayton CREEK, Canoga Park, LOS ANGELES, CALIF. Los Angeles County Flood Control Dist., 2250 Alcazar St., Los Angeles, Calif. BA 5/26. CA 6/13. CD 6/2/61, under LB.

▲ **Papac Constr. Co.**, 2030 N. Hoyt Ave., El Monte, Calif., CA **$1,412,003**, rein.-conc. CONDUIT for Dominguez Channel, Compton Blvd. to Rosecrans Ave., Gardena, LOS ANGELES, CALIF. Los Angeles County Flood Control Dist., 2250 Alcazar St., Los Angeles, Calif. BA 6/2. CA 6/13. CD 6/7/61, under LB.

▲ **Ben C. Gerwick, Inc.**, 2050 Wilmington-San Pedro Rd., San Pedro, Calif., LB **$2,058,217**, (3 bidders), Proj. 1433, 2,100 ft. concrete WHARF, Berths 136-139, Wilmington, LOS ANGELES, CALIF. Los Angeles Harbor Dpt., City Hall, Los Angeles, Calif. BA 6/14. CD 6/6/61.

▲† **Alcan Pacific Co.**, 1921 Stockton St., Sacramento, Calif., LB **$3,289,000**, 200 unit CAPEHART HOUSING, Pacific Missile Range, Spec. 36874, POINT MUGU, CALIF. 11th Naval Dist. P. Wks., 1220 Pacific Hy., San Diego 1, Calif. BA 6/14. CD 5/5/61.

Baldwin Constr. Co., Box 311, Marysville, Calif., CA **$540,930**, SEWAGE TREATMENT PLANT, ROSEVILLE, CALIF. City, City Hall, Roseville, Calif. CD 5/8/61, under LB

† **Machinery Service, Ltd.**, 2001 Kahai, Honolulu, Hawaii, LB **$91,583** Alt. 1, LB **$91,272** Alt. 2 (2 bidders), Proj. 215-61, fabrication and erection RANGE and CHANNEL LIGHT STRUCTURE, Kalihi Channel, HONOLULU, HAWAII. 14th Coast Guard Dist., Pier 14, Honolulu, Hawaii. BA 6/6. CD 6/22/61

James W. Glover, 1046 Waimanu, Honolulu, Hawaii, LB **$369,917** (5 bidders), PARKING AREAS and related work, Stage 9, Honolulu International Airport, Proj. 5883-9, HONOLULU, HAWAII. Hawaii Aeronautics Comn., Honolulu International Airport Bldg., Honolulu, Hawaii. BA 6/8. CD 6/29/61.

BUILDINGS—LB & CA

Industrial & Commercial Constr. Co., Box 4, Fairbanks, Alaska, CA **$719,823**, rein.-con. FIRE HEADQUARTERS, FAIRBANKS, ALASKA. City, City Hall, Fairbanks, Alaska. BA 3/24. CA 3/27. CD 4/4/61, under LB.

† **Dresser-Ideco Co.**, 875 Michigan St., Columbus, O., LB **$294,000**, 1,200 ft. TOWER, alternate, LB **$362,450**, 1,500 ft. TOWER (5 bidders), Nevada Test Site, MERCURY, NEV. Atomic Energy Comn., 1233 S. Main St., Las Vegas, Nev. BA 6/6/61. CD 5/11/61.

A. W. Stevens Constr. Co., 335 N. Baker St., Mount Vernon, Wash., LB **$116,478** (9 bidders), 135-car PARKING DECK over Skagit River at edge of business district, MOUNT VERNON, WASH. City, City Hall, Mount Vernon, Wash. BA 6/7/61. CD 10/10/60.

▲ **A. V. Peterson Co.**, 2827 N.E. Glisan St., Portland, Ore., CA **$1,432,697** (6 bidders), 3 story, concrete SERVICE CENTER, PORTLAND, ORE. Northwest Natural Gas Co., Public Service Bldg., Portland, Ore. BA 6/6/61. CD 5/26/61

Atkins & Cowam Constr. Co., 5144 Gardenia Ave., Long Beach, Calif., LB **$472,900**, est. $510,000 (10 bidders), 2 story Verdugo Hills HIGH SCHOOL, Tujunga, LOS ANGELES, CALIF. Bd. Educ., 1425 S. San Pedro St., Los Angeles, Calif. BA 6/13. CD 5/22/61.

▲† **Alcan-Pacific Co.**, 1921 Stockton Block, Sacramento, Calif., CA **$2,438,950**, 150 unit CAPEHART HOUSING, U. S. Naval Post Graduate School, MONTEREY, CALIF. Dist. P. Wks. Office, 12th Naval Dist., Rm. C 112, San Bruno, Calif. BA 5/16. CD 5/19/61, under LB.

▲ **Hawaiian Dredging & Constr. Co. Ltd.**, 1350 Ala Moana Blvd., Honolulu, Hawaii, CA **$1,178,836**, 6 story IBM OFFICE, HONOLULU, HAWAII. Victoria Ward, Ltd., 1020 Auhai St., Honolulu, Hawaii. BA 5/10. CA 6/5. CD 5/19/61, under LB.

Town Constr. Co., 1010 S. King St., Honolulu, Hawaii, CA **$600,000**, 5 story PROFESSIONAL CENTER, HONOLULU, HAWAII. Herbert K. H. Lee and Dr. Ed. L. Lee, 1481 S. King St., Honolulu, Hawaii. Frank Robert, 1663 Kapiolani Blvd., Honolulu, Hawaii, archt. Alfred A. Yee & Assocs., 914 Ala Moana Blvd., Honolulu, Hawaii, engrs.

CANADA

BUILDINGS—BA

▲ **B. C., West Vancouver**—BA 7/5—Park Royal Shopping Centre Ltd. c/o 1030 W. Georgia St., Vancouver, 2 story brick, concrete DEPARTMENT STORE, $2,500,000. C. B. K. Van Norman & Assocs., 1030 W. Georgia St., archts. CD 11/23/59.

HEAVY CONSTRUCTION—LB & CA

BRITISH COLUMBIA—British Columbia Govt., Parliament Bldgs., Victoria, Bids Opened 6/2, ROAD,
Peter Kiewit Sons Co. of Canada Ltd., 1587 W. 8th Ave. Vancouver, B. C., LB **$698,678**, Proj. 1197, constr. 11.93 mi. Terrace-Kitimat Hy., (Terrace-Lakelse Section). CD 5/29/61.

BRITISH COLUMBIA—British Columbia Govt., Parliament Bldgs., Victoria, Bids opened 6/6, BRIDGE, Interior **Contracting Co., Ltd.**, 1372 Fairview Rd., Penticton, B. C., LB **$137,444** (8 bidders) Bridge Proj. 377, Paulson Bridge, Grand Forks-Greenwood Electoral Dist. CD 5/25/61.

BRITISH COLUMBIA—British Columbia Govt., Parliament Bldgs., Bids opened 6/8, ROAD,
Thode Constr. Ltd. c/o D. J. Lawson, 530 Bastion St., Victoria, B. C., LB **$406,539** (6 bidders) base stab. bit. surf. South Peace River electrical dist., Proj. S 6461. CD 5/29/61.

MANITOBA—Manitoba Govt., Parliament Bldgs., Winnipeg, Bids opened 6/6, ROAD,
Kent Constr. Co., Brandon, Man., LB **$97,882** (7 bidders) drainage and embankment 486,000 cu. yds, excavation, 12.6 mi. Waskada Rd.

MANITOBA—Manitoba Dpt. P. Wks., Legislative Bldg., Winnipeg, ROADS,
Man.—**Commonwealth Constr. Co., Ltd.**, 300 Royal Bank Bldg., Winnipeg, Man., LB **$315,700**, (5 bidders), surf. 13.3 mi. Prov. Hy. No. 52 from Steinbach to Hy. 59.;
Man.—**Watsko Constr. Co.**, Hazelridge, Man., LB **$125,114**, (7 bidders), grading 2.33 mi. Prov. Hy. No. 85 from Inglis Corner north in R. M. of Shellmouth.

J. S. Quinn Constr. Co., Ltd., 999 Erin St., Winnipeg, Man., LB **$193,394** (5 bidders) supply and install 12,400 ft. 6 and 8 in. WATER MAINS, 13,420 8 and 10 in. SANITARY SEWERS, WELL PUMPHOUSE, SERVICES, structures SHOAL LAKE, MAN. Town, Town Hall, Shoal Lake, Man. Haddin, Davis & Brown Ltd., 503-265 Portage St., Winnipeg, Man., engr.

Poole Constr. Co., Ltd., Hamilton and 8th Sts., Regina, Sask., LB **$229,846**, (4 bidders), SEWERAGE SYSTEM, HUDSON BAY, SASK. Town, Town Hall, Hudson Bay, Sask. Haddin, Davis & Brown, (Sask) Ltd., 1965 Hamilton, Regina, Sask., engrs.

BUILDINGS—LB & CA

▲ **Commonwealth Constr. Co. Ltd.**, 700 Taylor St., Vancouver, B. C., CA **$1,568,078**, 100-bed rein.-conc. brick HOSPITAL, FORT ST. JOHN, B. C. Sisters of Charity of Providence, Fort St. John, B. C. BA 5/11/61. CA 6/8/61. CD 5/23/61, under LB.

▲ **E. H. Shockley & Son Ltd.**, 1936 Powell St., Vancouver, B. C., LB **$1,103,877**, (12 bidders), rein.-conc. COLLEGE OF EDUCATION, University of British Columbia, Campus, VANCOUVER, B. C. British Columbia Government, Parliament Bldgs., Victoria, B.C. BA 5/25/61. CD 5/2/61.

Louis Ducharme & Assocs., 753 St. Mary's Rd., Winnipeg, Man., LB **$571,347** (9 bidders) masonry, steel, concrete COLLEGIATE, Jefferson and Airlies Sts., WEST KILDONAN MAN Seven Oaks School Dist. No. 10, 800 Salters St., West Kildonan, Man. CD 12/22/60.

AMERICANS ABROAD

HEAVY CONSTRUCTION—LB & CA

▲ **Food Machinery & Chemical Corp.**, 1305 S. Cedar St., Lansing, Mich., U.S.A., CA **$2,000,000**, design and construct CANALIZATION, INTAKE STRUCTURES SITE PREPARATION, DRAINAGE and ROADS for Irrigation Proj. Tahrir Province, Nile Delta, EGYPT. Egyptian Land Reform Ministry, Cairo, Egypt.

U. S. POSSESSIONS

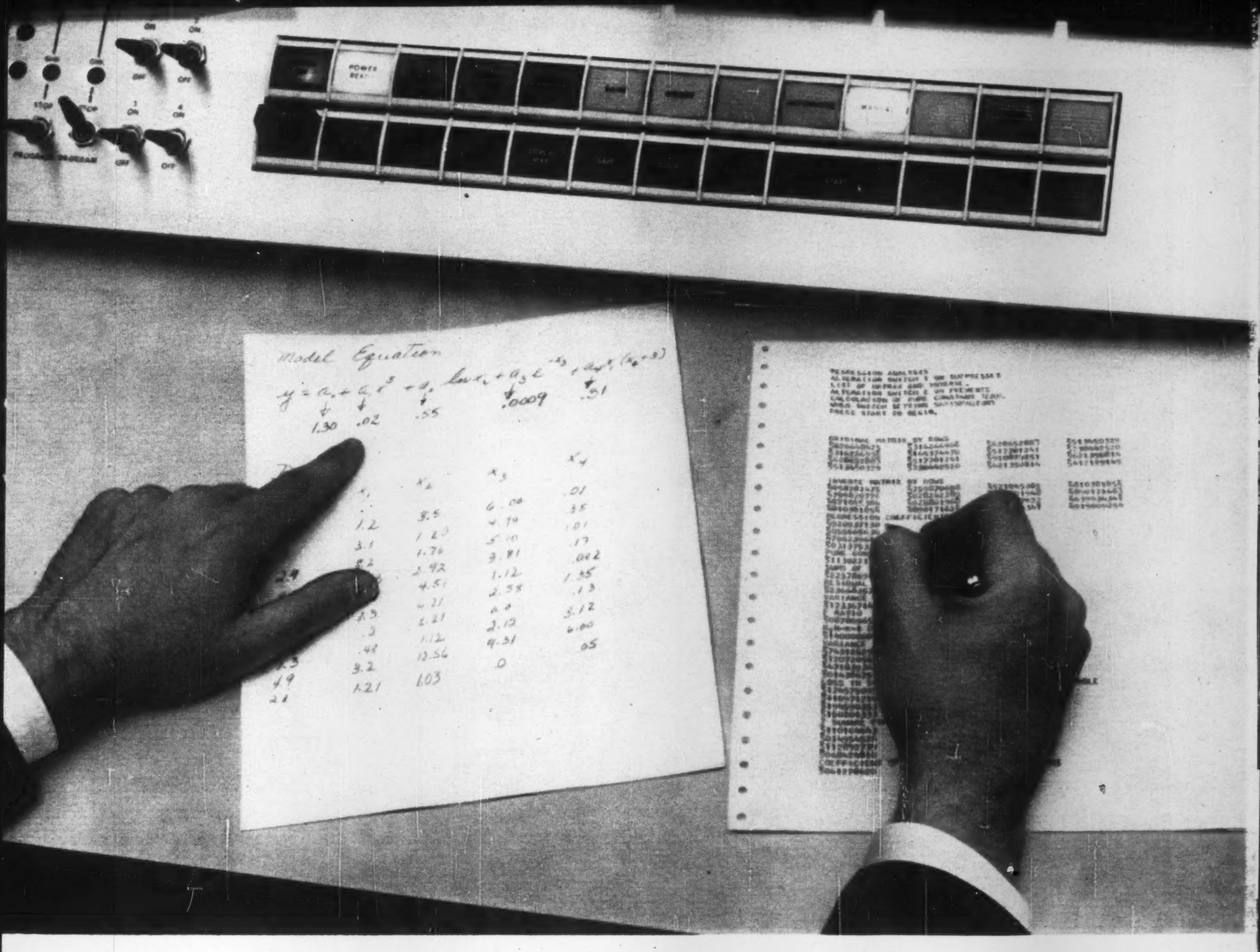
BUILDINGS—LB & CA

▲† **W. B. Uhlhorn Constr. Co.**, P.O. Box 2028, Harlingen, Tex., LB **$3,494,441** (6 bidders), 7 story HOSPITAL, GORGAS, CANAL ZONE. Panama Canal Co., Balboa Heights, Canal Zone. BA 6/5. CD 3/29/61.

FOREIGN

HEAVY CONSTRUCTION—BA

▲ **Egypt**—BA 10/3—Ways & Works Dpt., Egyptian Railways, 2 Midan Ramses, Cairo, double swing RAIL and ROAD BRIDGE over Suez Canal at El-Ferdan. Contractors must pre-qualify.



Want to find the coefficients? It's easy with the new Regression Analysis program for the IBM 1620

Here's another program offered free-of-charge to users of the IBM 1620 Data Processing System. It gives you the kind of results you might expect only from a much more expensive computer. But users of the 1620 know that its low rental cost is deceptive. The 1620 packs *more computing power per cubic inch* than any other computer in its size range.

The Regression Analysis program is a good example. Suppose you want a fit for production purposes. If you employ more than two variables you probably have difficulty visualizing the representation of your data. If linearity is not the case, you must often guess blindly at a polynomial of high degree, accept or reject the fit with something approaching a sixth sense, and either try again or settle for the results you have.

The new Regression Analysis program lets you handle expressions containing up to *24 variables.* If you have the even more complicated task of handling many dependent variables, the program will generate regression coefficients with a maximum number of dependent variables not exceeding one-half the number of independent variables.

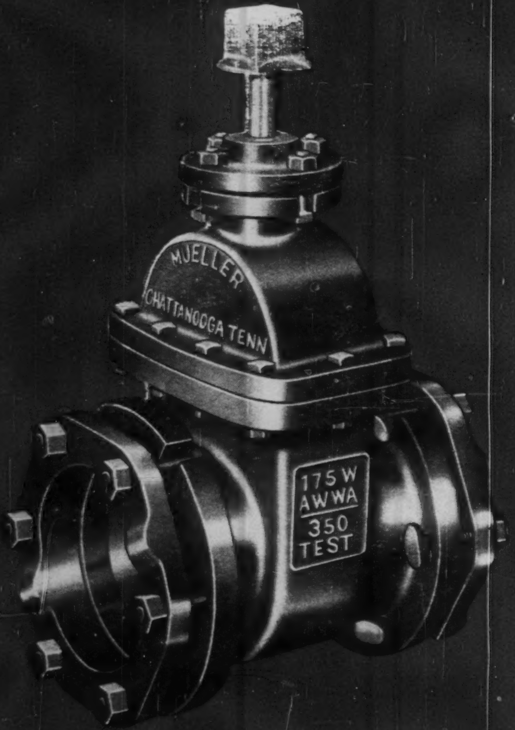
This program will also fit non-linear functions and hyper-surfaces. Compare this performance with that of any other computer in the 1620's price range.

A basic 1620 installation rents for just $1600 per month. For details, contact your local IBM Representative.

IBM's 1620 is a compact desk-size computer.

IBM®
DATA PROCESSING

CIRCLE 295 ON READER SERVICE CARD



DEPENDABLE

. . . a one word definition of
MUELLER® *Gate Valves!*

Mueller Gate Valves in your water supply or fire protection system is your assurance of years of maintenance-free service. This fact is due largely to a design-exclusive . . . Mueller's Four Point Wedging Mechanism that assures tight, sure shut-offs. This unique principle exerts equal seating pressure at four points near the edge of each disc to eliminate deflection and distortion. Write for complete information on the variety of ends and wide range of sizes on these AWWA Gate Valves.

specify Mueller . . . there is no "equal"!

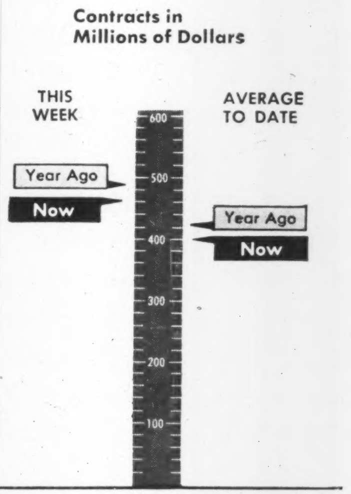
MUELLER CO. since 1857 QUALITY SERVING the Water and Gas Industries

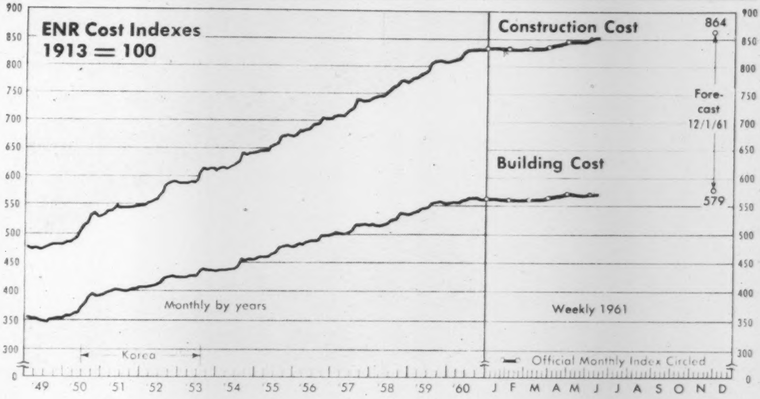
MUELLER CO.
DECATUR, ILL.
Factories at: Decatur, Chattanooga, Los Angeles
In Canada: Mueller, Limited, Sarnia, Ontario

5584

Construction Scoreboard

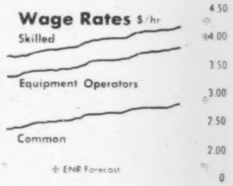
This Week . . .

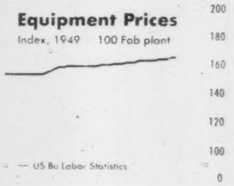


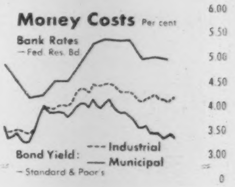


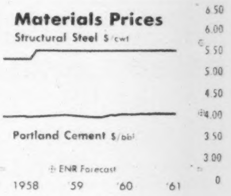
ENR INDEXES (1913=100), 20-cities' average	Week of June 15 1961	% Change from May 18 1961	% Change from June 16 1960
Construction Cost	851.65	+0.4	+3.0
Building Cost	570.72	+0.3	+1.8

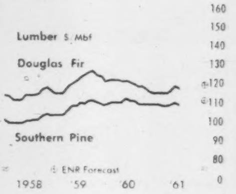
To convert above indexes to 1926 = 100: Divide Construction Cost by 2.080; Building Cost by 1.850.
1919 = 100: Divide Construction Cost by 4.770; Building Cost by 3.518.

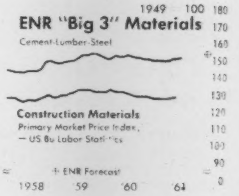












AMOUNT OF CONTRACTS LET

Contracts Awarded In 50 States By Type	This Week millions	Cum. 25 wks 1961 millions	Cum. 25 wks Chge '60-'61 %
All Heavy Construction	$469.6	$10,473.2	+0.5
By Ownership			
PRIVATE	228.8	5,303.1	− 6
PUBLIC	240.8	5,170.1	+ 7
State & Municipal	177.6	3,921.5	+ 6
Federal	63.2	1,248.7	+10
By Type of Work			
PUBLIC			
Waterworks	8.3	181.5	−21
Sewerage	14.6	347.2	+29
Bridges*	9.7	276.6	−30
Highways	76.1	1,723.0	+13
Earthwork, Dams & Waterways	20.8	434.1	+21
Buildings:			
Excl. Housing	59.5	1,220.4	+ 8
Housing	22.5	391.6	+48
Unclassified	29.4	595.8	−10
PRIVATE			
Buildings:			
Mass Housing	87.6	2,344.4	−15
Commercial	59.0	1,233.8	+12
Industrial	70.9	1,501.5	+19
Unclassified	11.2	223.3	−53

***Includes Private bridges**

NOTE: Minimum size projects included are: Waterworks and waterways, $53,000; other public works, $88,000; industrial buildings, $110,000; other buildings, $400,000.

NEW CONSTRUCTION CAPITAL

	Week of June 15 millions	Cum. 24 wks 1961 millions	Cum. 24 wks Chge '60-'61 %
Corporate Securities	$172.1	$1,778.5	+24
State and Municipal:			
All Except Housing	170.1	3,121.5	+ 5
Housing	0	31.3	+130
Federal Loans	0.9	103.2	+42
Federal Aid	0	0	−100
Total Nonfederal	$343.1	$5,034.5	−30
Federal Appropriations:			
Projects in U.S.	0	1.0	−95
Outside U.S.	0	0	−100
Total New Capital	$343.1	$5,035.5	−32

MATERIALS SHIPMENTS

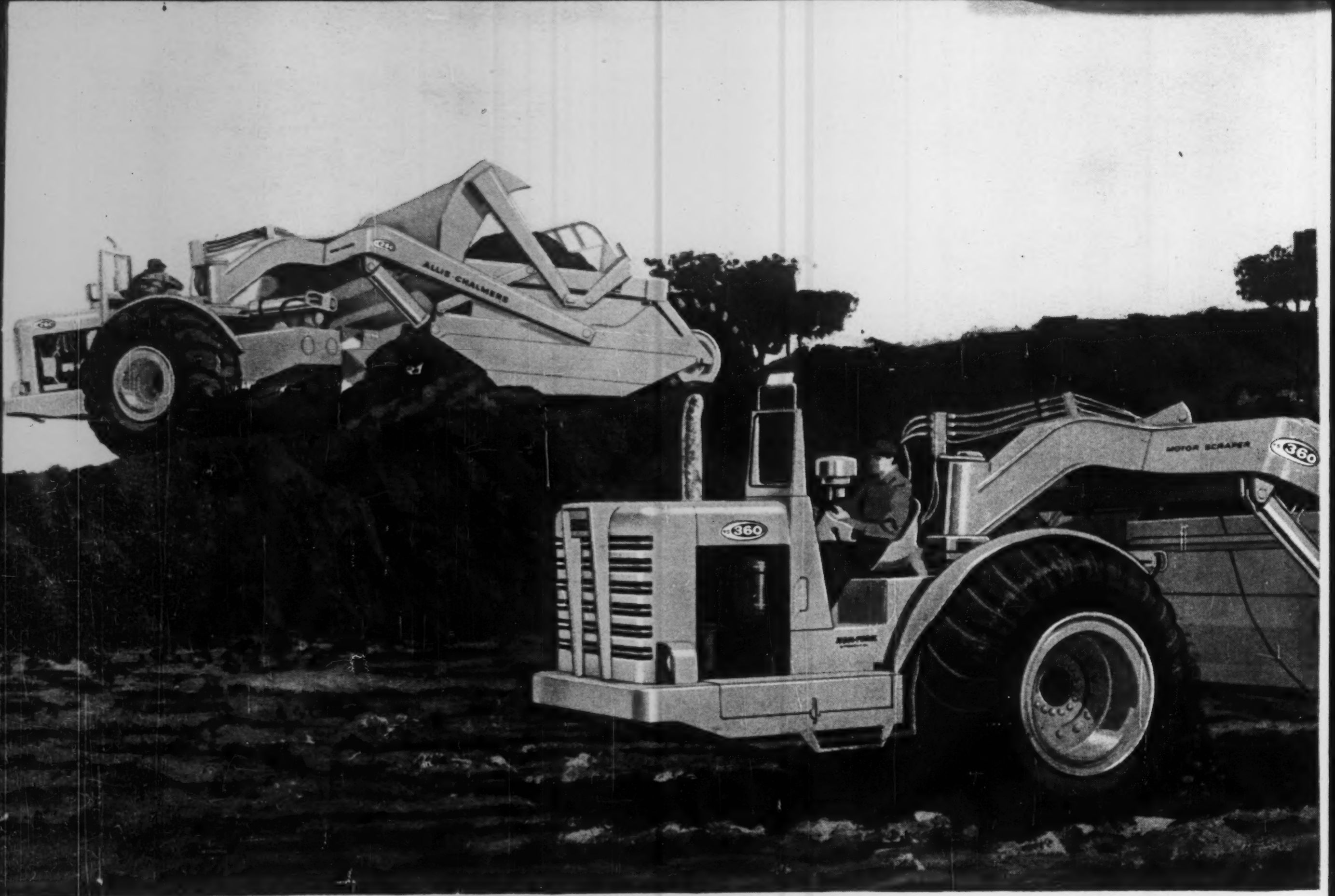
		1961 Apr. (A) Mar. (M)	1961 Cum. (No. of Mos.)	% Chg. from Year Ago Mo.	% Chg. from Year Ago Cum.
Portland Cement, Bur Mines	thous bbls	24,531(A)	74,941(4)	−10	+ 4
Concrete Paving Awards, PCA	thous sq yd	10,522(A)	34,265(4)	+25	+16
Fabricated Structural Steel	thous tons	319(A)	1,133(4)	− 1	− 1
Bookings, AISC	thous tons	309(A)	1,170(4)	−20	−13
Reinforcing Bars, Net, AISI	thous tons	237(A)	708(4)	+46	+18
Lumber, total, NLMA	mil fbm	2,758(A)	10,143(4)	−10	−11
Production, total	mil fbm	2,567(A)	9,828(4)	− 6	−16
Orders, total	mil fbm	2,676(A)	10,662(4)	−10	− 6
Douglas Fir	mil fbm	626(A)	2,576(4)	− 6	− 6
Southern Pine	mil fbm	550(A)	2,174(4)	−14	+ 4
Unfilled Orders, Douglas Fir	mil fbm	529(A)	496(4)**	−17	−25**
Southern Pine	mil fbm	290(A)	243(4)**	+34	+22**
Clay Products, Bureau of Census					
Brick, Unglazed, Common, Face	mil bri	491(M)	1,155(3)	+25	+ 4
Vitrified Clay Sewer Pipe	thous tons	128(M)	333(3)	+10	+ 1
Structural Tile, Unglazed	thous tons	37(M)	95(3)	+ 7	− 7
Asphalt Products, Bureau of Census					
Asphalt Roofing	thous sales sqs	3,834(M)	7,498(3)	+ 1	−24
Asphalt Siding	thous sales sqs	65(M)	146(3)	+18	−15
Aluminum, Wrought, Net, Bur Census					
Sheet and Plate (non-heat treatable)	mil lbs	107(M)	290(3)	+ 1	− 5
Wire and Cable	mil lbs	29(M)	76(3)	+15	+ 8
Extruded Shapes (soft alloys)	mil lbs	69(M)	188(3)	+ 1	− 6

EMPLOYMENT AND FAILURES

Contract Const Employment, BLS	thous	2,613(A)	2,422(4)**	+ 1	− 1**
Contractor Failures, Dun & Bradstreet					
Number		245(A)	992(4)	+11	+17
Liabilities	thous	$13,127(A)	$59,584(4)	− 4	+ 7

** Average per month

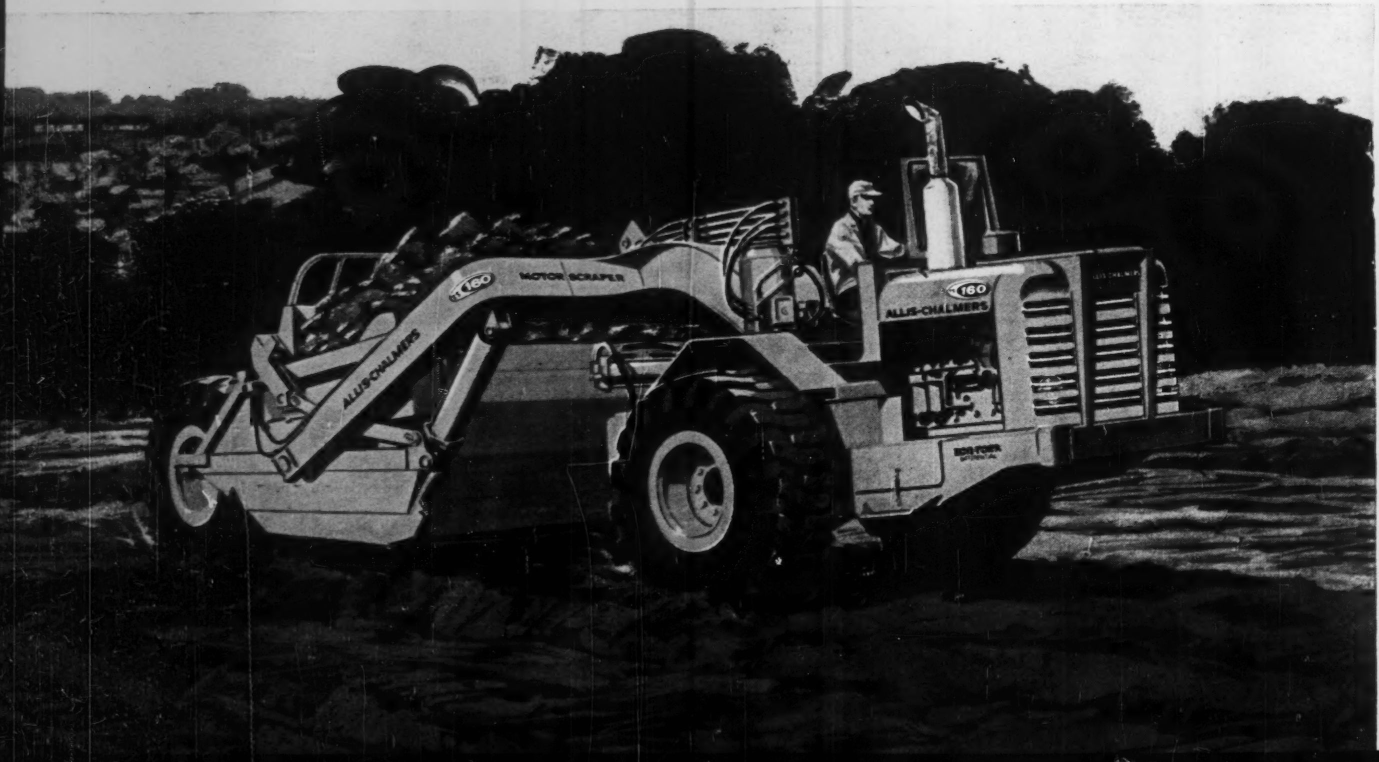
CIRCLE 298 ON READER SERVICE CARD→

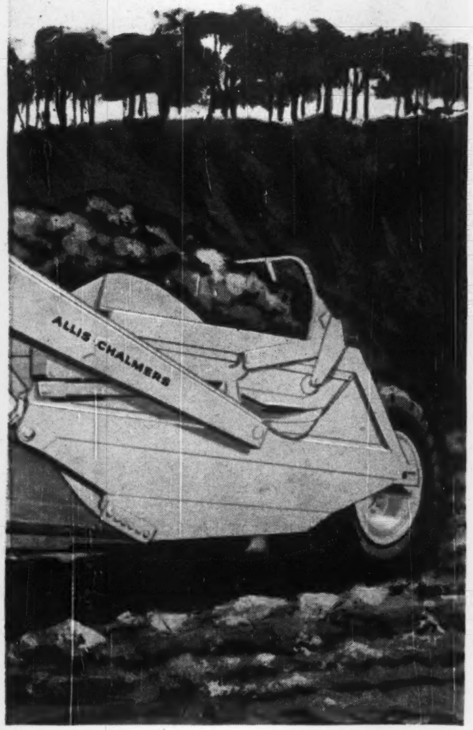

ALLIS-CHALMERS
MOTOR SCRAPER
360
360

TS-260
18-yd—230-hp

TS-360 30-yd—340-hp

TS-160 11-yd—155-hp


MOTOR SCRAPER
160
ALLIS-CHALMERS
160
ALLIS-CHALMERS



ONLY ALLIS-CHALMERS ALL-HYDRAULIC MOTOR SCRAPERS give you full-power advantages in every phase of the cycle

. . . plus important new improvements to increase production, provide new strength and life. Now you get even more dirt-hustling horsepower from Allis-Chalmers. Every model offers you full-power steering, loading, spreading, and traction. New improved design and tougher metals bring extra strength and durability to transmissions, differentials, and hitch assemblies. Independent apron control on the TS-360 speeds up loading and spreading in unusually dry, free-flowing materials.

Allis-Chalmers low-maintenance, all-hydraulic design, backed up by major performance and durability achievements, lets you challenge today's toughest earth-moving jobs confidently. See the '61 line in time to *step up your "bid-power" with full-power features.*

Select the size that fits your jobs best from the world's only complete line of *full-power*, all-hydraulic motor scrapers. From ditching to dam building, there's an Allis-Chalmers motor scraper with the right combination of job-proved features to match any earth-moving situation. Prove it to yourself with a comparative demonstration before you bid your next job. *Allis-Chalmers Construction Machinery Division, Milwaukee 1, Wisconsin.*

NEW! 13% more capacity in the TS-160 . . .

The new TS-160 now carries 8.5 struck yards . . . 13% more than previous models. The TS-160 is the only machine in its class backed up with "big" scraper performance features. The "160" also gives you the widest cutting surface for easier loading, smoother finishing . . . the highest apron opening for fast, clean spreading. See the 155-hp TS-160 today. It'll work alone, or fit right into your largest earth-moving spread.

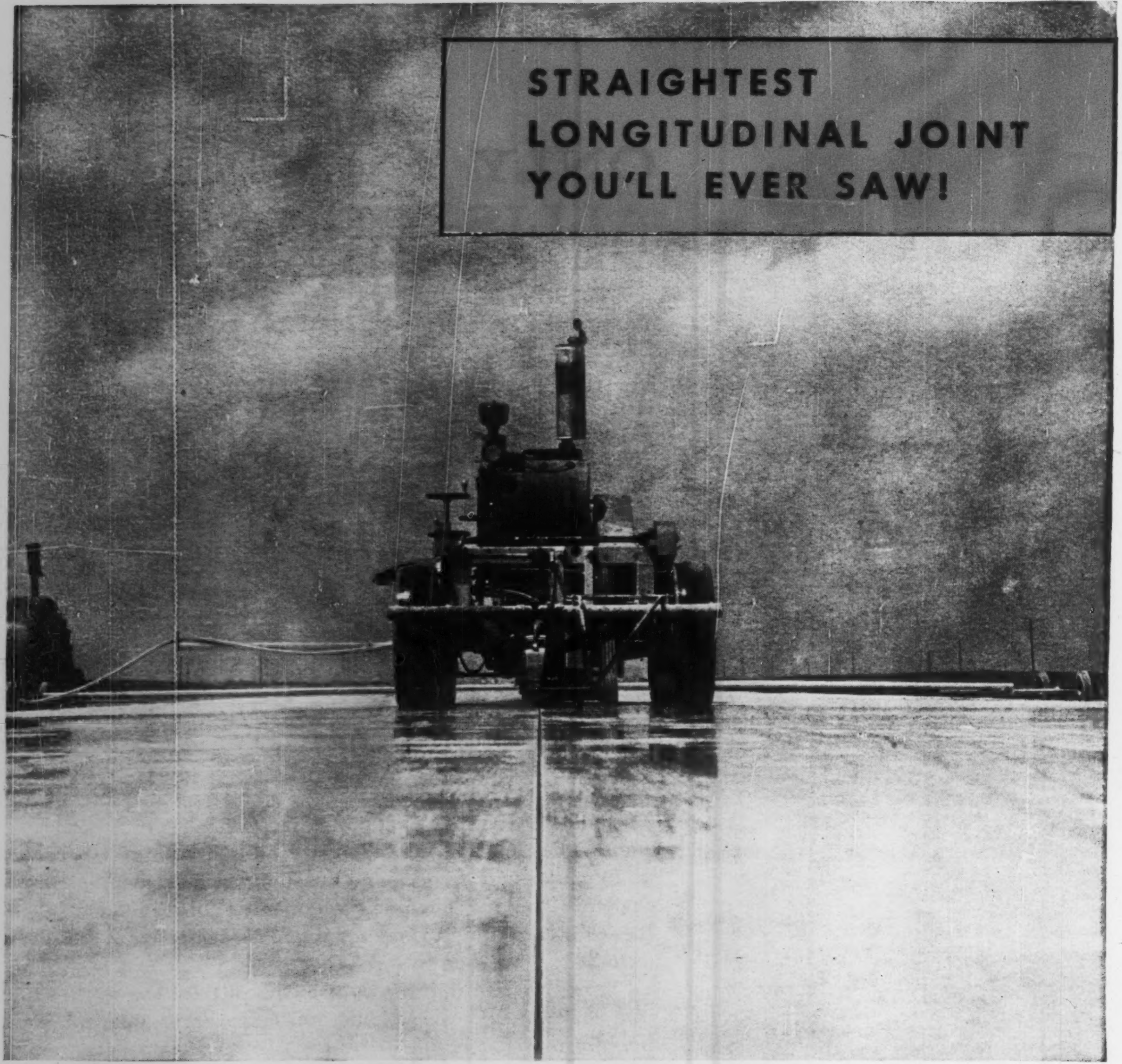
STEP UP YOUR

Performance
Operator comfort
Wearability
Ease of maintenance
Reliability

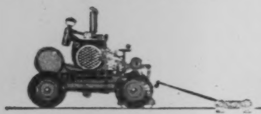
WITH

ALLIS-CHALMERS
POWER FOR A GROWING WORLD

STRAIGHTEST LONGITUDINAL JOINT YOU'LL EVER SAW!



U. S. Highway No. 10 near Tappan, North Dakota. Northern Improvement Company, Contractors.



'ROUND THE CURVES—ON THE STRAIGHT-A-WAY . . .

. . . The powerful new Clipper Longitudinal Concrete Saw cuts straight and true at speeds up to 35 feet per minute, without a waver — without an operator!

Clipper manufactures the widest range of gasoline and electric powered concrete saws and diamond reinforced abrasive blades for all concrete and asphalt sawing jobs. Call your Clipper Factory Trained Representative COLLECT Today, for an on-the-job demonstration without obligation.

Sold Direct by Clipper Factory Trained Representatives from Offices and Warehouses Coast to Coast.

Clipper®

MANUFACTURING CO. KANSAS CITY 8, MO.

General Offices and Factory — 2803 Warwick — Phone GRand 1-0766

Makers of SuperMatic Masonry Saws and Blades—Diamond Core Bits and Drills

439X FACTORIES IN ENGLAND—FRANCE—GERMANY—ITALY

Mr. Clipper

Interstate Apportionments for Fiscal '63

	Present	New*	Gain		Present	New*	Gain
	(In millions of dollars)				(In millions of dollars)		
Ala.	$41.4	$49.6	$8.2	Nebr.	11.7	14.0	2.3
Ariz.	28.1	33.7	5.6	Nev.	10.1	12.1	2.0
Ark.	20.9	25.1	4.2	N. H.	9.0	10.8	1.8
Calif.	191.2	229.4	38.2	N. J.	52.1	62.6	10.5
Colo.	26.5	31.8	5.3	N. M.	20.0	23.9	3.9
Conn.	28.2	33.9	5.7	N. Y.	94.7	113.7	19.0
Del.	7.4	8.9	1.5	N. C.	16.4	19.6	3.2
Fla.	41.5	49.8	8.3	N. D.	8.8	10.6	1.8
Ga.	36.8	44.2	7.4	Ohio	136.5	163.8	27.3
Hawaii	15.7	18.8	3.1	Okla.	24.1	28.9	4.8
Idaho	9.4	11.3	1.9	Ore.	34.7	41.7	7.0
Ill.	104.3	125.2	20.9	Pa.	89.4	107.3	17.9
Ind.	49.5	59.4	9.9	R. I.	7.4	8.8	1.4
Iowa	25.3	30.4	5.1	S. C.	17.3	20.7	3.4
Kan.	15.5	18.6	3.1	S. D.	13.1	15.8	2.7
Ky.	40.8	48.9	8.1	Tenn.	50.4	60.5	10.1
La.	57.8	69.3	11.5	Tex.	90.5	108.6	18.1
Me.	9.4	11.3	1.9	Utah	28.9	34.7	5.8
Md.	36.6	44.0	7.4	Vt.	13.8	16.6	2.8
Mass.	42.8	51.4	8.6	Va.	60.8	72.9	12.1
Mich.	77.9	93.5	15.6	Wash.	41.7	50.0	8.3
Minn.	51.7	62.1	10.4	W. Va.	30.1	36.1	6.0
Miss.	24.3	29.1	4.8	Wis.	17.7	21.2	3.5
Mo.	51.1	61.4	10.3	Wyo.	19.2	23.0	3.8
Mont.	18.7	22.5	3.8	D. C.	28.8	34.5	5.7

* New apportionments assume bill will pass in present form.

Highways Assured of $9 Billion

The federal-aid highway program is assured of more than $9 billion in new revenue that will permit completion of the Interstate System on schedule in 1972 and bigger spending on primary, secondary and urban roads.

The Senate approved the financing measure by voice vote after a comparatively brief debate late last week. A conference committee will iron out differences between the Senate bill and the previously approved House measure.

The bills differed only slightly in their financing provisions and on whether the bonus to states that limit billboards on the Interstate System should be extended for two years. The Senate voted to continue the bonus; the House did not.

The Senate bill would provide about $9.4 billion in new revenue, as compared with $9.8 billion in the House bill. Both measures would continue the federal gasoline tax at 4 cents a gallon and boost taxes on tires, tread rubber, tubes and the gross weight of heavy trucks. Both would also divert to highway use all of the revenue from the excise taxes on new trucks and parts now flowing into the general treasury. The revenue is presently split 50-50, between the Trust Fund and the Treasury.

The House wants diversion to start July 1, but the Senate would delay this for one year. The Senate bill would increase to 4 cents a pound the tax on tread rubber, while the House called for a 5-cent boost. The levy is now 3 cents a pound.

The Senate measure would also give gasoline station operators a 1% credit for waste and evaporation on their gasoline tax payments. The House provides no such allowance.

The Senate changes would reduce the amount of new highway financing $400 million below the level approved by the House. The conference committee is expected to split the difference, but not without some controversy over the billboard bonus and diversion of all of the excise taxes.

This would bring a slight setback in federal allotments to states for probably only one year—most likely the year starting July 1, 1963. The apportionment to be made next month for the year starting July 1, 1962 (see table) is expected to stay at the $2.4 billion level now planned.

Boost for Water

Texas speeds development of water resources

The Texas legislature passed two measures that will strengthen and enlarge the state's water development program.

One measure is a proposed amendment to the state constitution that would allow the purchase by the state of storage space in reservoirs built by the federal or local governments. This would mean construction of much larger water-storage units. The bill was described by Durwood Manford, chairman of the Board of Water Engineers, as "the most significant piece of state water legislation in years."

Final decision on state purchase of storage space is up to the voters in November. Then they will act on the proposed amendment. If approved, enabling legislation will be introduced at the 1963 legislature.

When action is completed, Texas will be able to contract with the federal government or a local agency building a dam for part of the potential water storage capacity. Bonds could be issued to pay for the state's share of the project or the Water Development Board could do its own financing. Bonds and their interest would be paid from funds received from the sale of water to cities and industries.

Reservoirs in the state are often built below potential capacity because water districts and municipalities lack the funds to build dams as large as they should be.

The second measure approved by the legislature will permit the Water Development Board to lend up to $15 million for construction of community water-supply projects.

Under the old legislation, the board was limited to one-third of the cost of each local project or $5 million, whichever was less. This limitation was believed responsible for the relatively slow progress of the state's $200-million water resources program. This program was approved by the voters in 1957.

Under the program, the state can sell $100 million worth of bonds without further approval by the legislature. The second $100 million worth could be issued after approval by a two-thirds majority in both houses of the legislature. So far, the state has sold only a small fraction of the first $100 million authorized.

First project expected to benefit from the new legislation is the Toledo Bend Dam on the Sabine River.

Business in Brief . . .

• **Engineer not an architect**—An engineer may not contract to provide architectural services, ruled the Jefferson County Common Pleas Court at Steubenville, Ohio. The case involved a contract between Ralph Fanning & Associates and the College of Steubenville. The agreement called for preliminary studies and architectural design as well as structural, electrical and mechanical engineering.

• **Squeeze play**—Texas is having trouble providing funds to match federal highway grants and paying for year-to-year maintenance of the state's road network. State law—which doesn't allow highway money to be used for both construction and maintenance—should be changed, according to Herbert C. Petry Jr., chairman of the Texas Highway Commission.

• **Billboard ban upheld**—Wisconsin's law regulating billboards along the Interstate was upheld by a county circuit court. The judge ruled that regulation of roadside advertising is a "constitutional exercise of the state's police power."

• **Getting bigger**—Ralph M. Parsons Co., Los Angeles engineering-construction company, bought Anaconda-Jurden Associates, Inc., of New York City. The acquired company will be an operating subsidiary named Parsons-Jurden Corp.

• **Oil company outlays**—American Oil Co. is moving on a $100-million program to modernize existing facilities and construct new units. Most of the money will be spent in the South and East.

• **Two-mile high tunnel**—Colorado's $61.2-million state highway budget contains $1.5 million for planning of a highway tunnel under the Continental Divide. Total cost of the project is estimated at $78 million. E. Lionel Pavlo Engineering Co., New York City, has the planning job. The 7,170-ft tube will be at an elevation of more than 11,000 ft.

• **No more do-it-yourself**—New Orleans no longer will do its own street resurfacing. From now on, the city will let such contracts to contractors. The city expects to save about $82,000 yearly under the new system.

• **Big difference**—Lowest bid for excavation and construction of Cougar Dam powerhouse on Oregon's McKenzie River was 25% above Army Engineers' estimates. Low bid of $1,365,594 was submitted by S. & C., Inc. and West Coast Electric Co., Inc. of Seattle. The Corps' estimate was $1,071,762.

• **Levitt reports loss**—Levitt & Sons, Inc., Levittown, N. J., reported an after-tax loss of $763,155 for the fiscal year ending February 28.

• **Utilities to pay**—Gov. Mark Hatfield of Oregon vetoed a bill that would have permitted the state highway department to pay utilities for the cost of relocating their facilities from the path of highway projects.

• **Multimillion-dollar baby**—F. W. Woolworth Co. has announced that it will spend $150 million for expansion in the next five years.

• **Liquid shortcut**—The government of Spain and the City of Seville will jointly finance construction of a 42.5-mile navigation canal linking Seville with the Atlantic port of Bonanza.

• **Nile crossing**—The Egyption Railways, at Cairo, is advertising for bids for construction and supply of materials for a combination rail and highway bridge over the Nile at Luxor. Bid opening will be September 23.

• **Right-to-work**—The Oklahoma legislature killed—by burying in committee—bills that would have amended the state constitution to ban the union shop. Oklahomans for Right-to-Work, Inc. now plans to seek an initiative petition to bring the issue to a vote.

• **Paperboard mill**—Federal Paper Board Co., Inc., of Bogota, N. J. will build a $15-million paperboard mill at Versailles, Conn.

• **Billboard bonus**—Kentucky and Pennsylvania completed action qualifying them for bonus funds under the Interstate program. Pennsylvania's Gov. David L. Lawrence signed a bill banning billboards within 660 ft of Interstate highways. The move will boost federal aid by about $6 million. Kentucky took similar action.

Office Start Due

$100-million Boston job coming within a year

Construction of the first building in Boston's long-planned $100-million government office center will get under way within a year.

Removal of major legal obstacles cleared the way for clearing the site planned for a $26-million state general office building. A construction start on other major components of the center, however, appears to be at least 18 months to two years away.

Units planned for the 70-acre site include a $25-million state health and welfare center, a $35-million to $40-million federal building and a $20-million municipal building. A private commercial and residential area will also be part of the over-all development.

Although construction is generally some time off, planning and design work for several of the structures has started.

Boston's Mayor John F. Collins soon will approve a $75,000 appropriation to cover operating costs of a Government Center Commission. First job of the commission is handling a design competition for the 12-story city building. Eight semi-finalist in the architectural competition will be selected in August. Each will receive a $5,000 prize. Top winner to be determined in December will receive $10,000 and also the design contract.

Competition rules will be completed this month by a group headed by Prof. L. B. Anderson of MIT.

Directing planning for the federal building are Boston Federal Office Building Architects, a joint venture of Architects Collaborative and Samuel Glazer Associates.

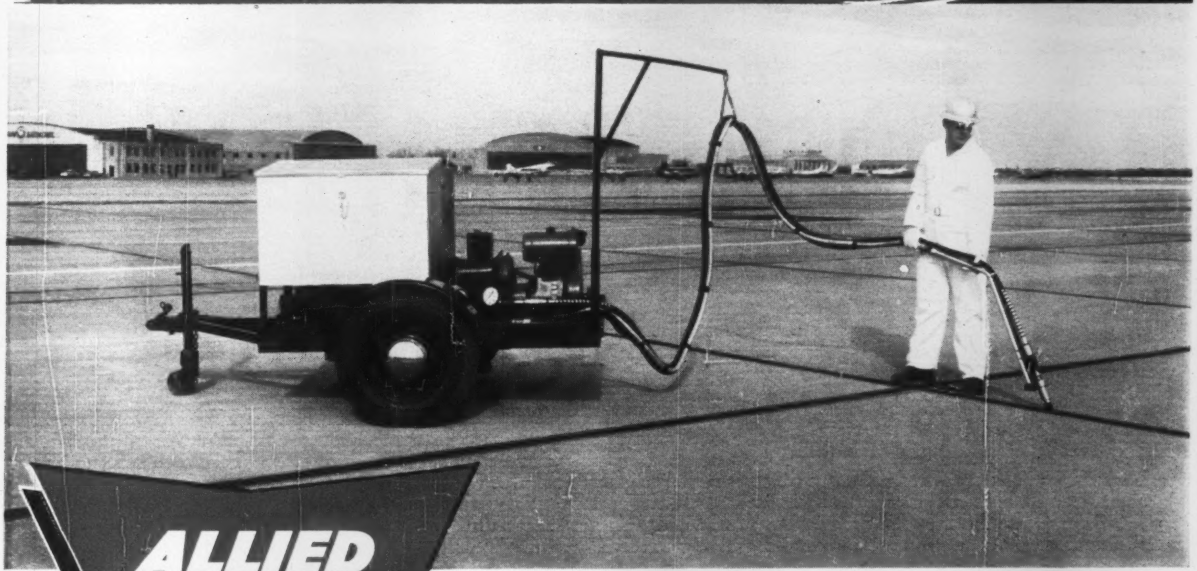
To finance land and buildings acquisition in the area selected for the federal and city buildings, the Boston Redevelopment Authority has asked for a $22.9-million federal loan. Property acquisition is expected to start by July 1.

Show's Winter Success Prompt Autumn Encore

The success of last year's Industrial Building Exposition and Congress, despite a blizzard that struck New York City during its mid-December showing, has prompted the sponsors to schedule a 1961 congress.

The second event will take advantage of New York City's moderate fall weather, with dates September 25 through 28. Like last year's show, it will be staged at the New York Coliseum. Administration and techniques of industrial building will be explored.

IN STEP WITH THE JETS!



ALLIED
Jet Seal®

TOPS MILITARY
REQUIREMENTS

FOR BLAST RESISTANT CONCRETE JOINT SEALANT

Allied JET SEAL (**Product 9015M**) and the exclusive Applicator originated by Allied, compose the only complete system of material and application developed for the jet age.

- JET SEAL withstands the terrific heat and blast of jets.
- JET SEAL cures rapidly—construction can be opened to all traffic in one hour without fear of wheel pickup.
- JET SEAL is improved in adhesion, cohesion, resilience and low-temperature ductility (—20°F).
- JET SEAL is unaffected by jet fuel, oil and solvents.
- JET SEAL has no gravity or cold flow tendencies even at 200°F or more.

The special application equipment, originated by Allied, automatically proportions, mixes and places the material in one fast continuous operation.

It all adds up to easy application, and expectant life as much as 500% over presently used J.F.R. materials.

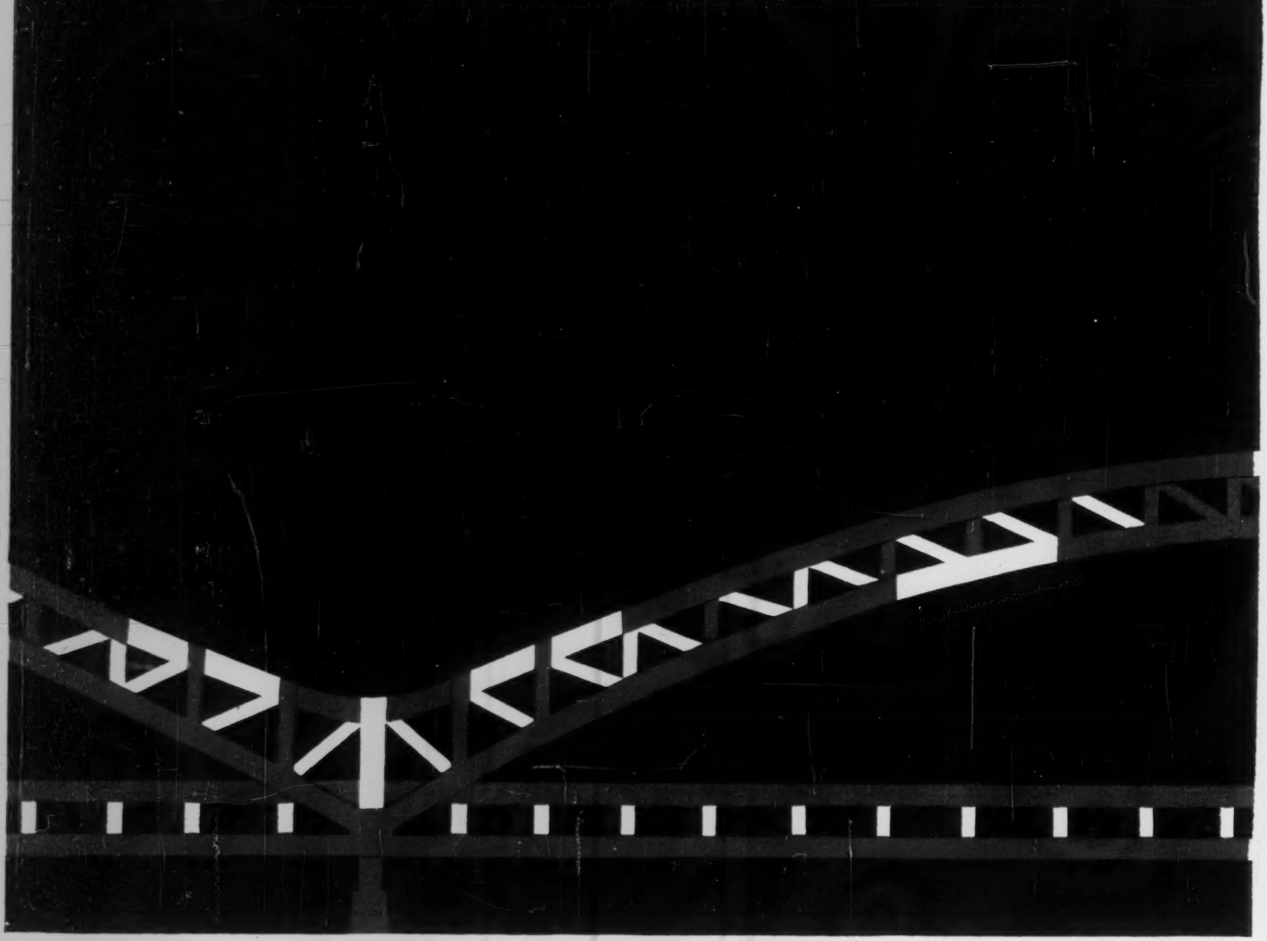
FOR MORE INFORMATION ABOUT Allied JET SEAL, and the ALLIED-STROUD APPLICATORS, Write to:

ALLIED
MATERIALS CORP.

PRODUCERS, REFINERS AND
COMPOUNDERS OF SPECIAL ASPHALT
AND COAL TAR PRODUCTS

ALLIED BUILDING • 5101 N. PENNSYLVANIA • P. O. BOX 7278 • 39TH STREET STATION • OKLAHOMA CITY, OKLA.
PLANTS: STROUD, OKLA. • DETROIT, MICH. • LOS ANGELES, CALIF.

design steels used for efficiency and



Sketch of one span of the two-span bridge showing where it was most efficient to take advantage of the high yield strength provided by steels such as USS "T-1" Steel (in red), USS TRI-TEN High-Strength Low-Alloy Steel (in white), A7 and A373 Structural Carbon Steel (in gray). Louisville-New Albany Bridge

The new double-deck, two-span, tied-arch bridge spanning the Ohio River between Louisville, Kentucky, and New Albany, Indiana, should be extremely interesting to bridge designers and engineers.

Designed by the consulting firm of Hazelet & Erdal, this bridge is another fine example of the application of heat-treated constructional alloy steel, high-strength low-alloy and structural carbon steels to provide the desired strength at the least weight and lowest cost. A total of 7,641 tons of steel were used in the two 800-foot spans and the approaches.

Because much of this bridge was shop welded, the excellent welding properties of USS Design Steels played an important part in their selection. The weldable, constructional alloy USS "T-1" and high strength Tri-Ten Steels both permitted the design engineers to obtain considerable savings in the amount of steel needed, resulting in a substantial reduction in the total cost of the structure. The saving in steel tonnage reduced dead weight enough to effect still further savings by reduced loads on individual truss members, piers, and foundations.

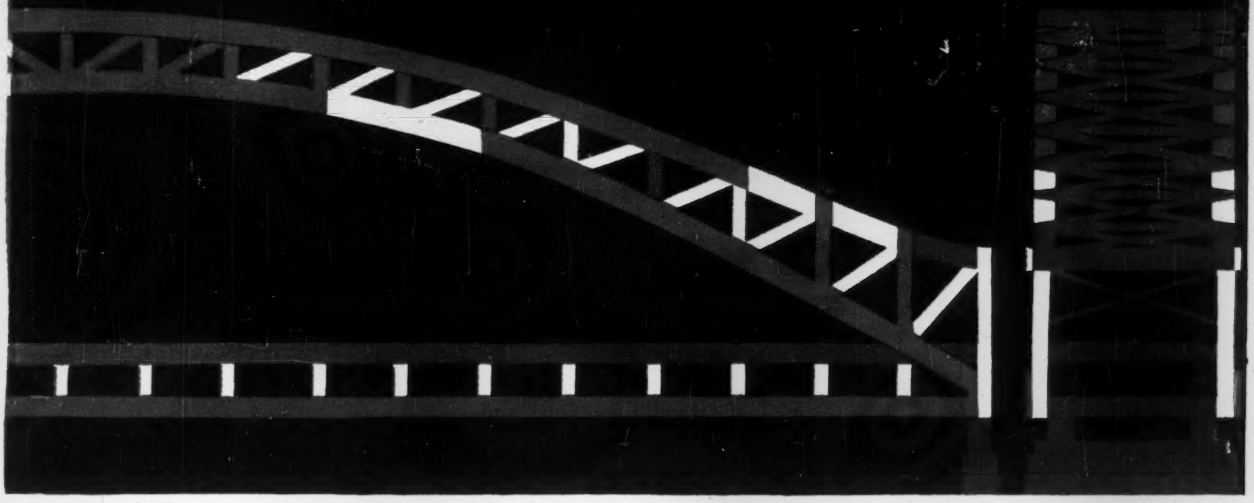
All of the tie and most of the highly stressed upper and lower chords and some verticals were made of 100,000 psi yield strength heat-treated constructional alloy steel. Approximately 1,500 tons of USS "T-1" Constructional Alloy Steel were used.

Most of the diagonals, some of the top and bottom chords and approach trusses called for 50,000 psi high-strength low-alloy ASTM A242 steel. USS Tri-Ten Steel—1,535 tons of it—was used for these applications. (USS Tri-Ten Steel can also meet specification ASTM A441.)

United States Steel also furnished 1,100 tons of ASTM A373 and 1,550 tons of ASTM A7 structural carbon steel, used in the lesser stressed members of the bridge and approaches.

This mark tells you a product is made of modern, dependable Steel

economy in Louisville-New Albany Bridge



was designed by Hazelet & Erdal, Consulting Engineers, Louisville, Kentucky, for the State Highway Department of Indiana and Kentucky Department of Highways. Fabricator: The R. C. Mahon Co., Detroit, Michigan. Erector: John F. Beasley Construction Co., Dallas, Texas (Sub-contractor to Mahon).

Two other USS High Strength Steels have been widely used for bridges—USS MAN-TEN ASTM A440 and USS COR-TEN Steels. Both have a 50,000 psi minimum yield point. USS COR-TEN Steel offers outstanding resistance to atmospheric corrosion and superior paint adherence qualities. It is a natural choice for riveted structures in corrosive areas. USS MAN-TEN ASTM A440 Steel is the lowest priced of our High Strength Steels and is generally used for riveted structures. Recently introduced, USS "T-1" Type A Steel is the newest member of our famous family of constructional alloy steels and offers, at the same strength level as "T-1" Steel, a more economical grade for applications 1″ thick and under. For more information on any of these USS Design Steels, write United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

USS, "T-1", COR-TEN, TRI-TEN and MAN-TEN are registered trademarks

USS Steels for bridge design

	PSI Min. yield
Structural Carbon Steel (A373)	32,000
Structural Carbon Steel (A7)	33,000
Structural Carbon Steel (A36)	36,000
USS COR-TEN High Strength Steel	50,000
USS MAN-TEN (A440) High Strength Steel	50,000
USS TRI-TEN (A441) High Strength Steel	50,000
USS "T-1" Constructional Alloy Steel	100,000

United States Steel Corporation, Pittsburgh • Columbia-Geneva Steel, San Francisco • National Tube, Pittsburgh • Tennessee Coal & Iron, Fairfield, Alabama • United States Steel Supply, Steel Service Centers United States Steel Export Company

United States Steel

ALPHA BETTER CONSTRUCTION THROUGH BETTER USE OF CEMENTS

news and notes from the field

The Right Way To Make a Slump Test

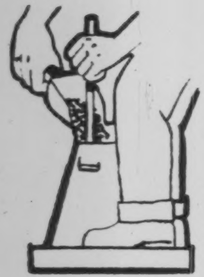
In many cases the acceptance or rejection of a load of concrete depends upon a one-inch variation in the slump. This much variation can be—and often is—caused by mistakes in making the slump test.

Sampling

If the slump test is to determine acceptability of the concrete, the sample must be taken from the early part of the load. Let out at least a wheelbarrowful before taking the sample. The first concrete out of the mixer should never be used for testing.

If the test is to be representative of the entire load, take samples from three parts of the load, directly from the mixer discharge. The total sample should be at least 80 lbs. and should be remixed in wheelbarrow before making slump.

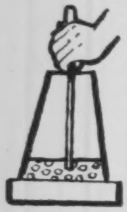
1. Place Slump Cone on Plank, Slab or Steel Plate



Moisten the inside of the cone and place it on a flat, level, firm surface which extends several inches beyond the base of the cone. When putting concrete in the cone stand on the foot lugs to hold it firmly in place.

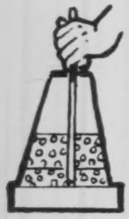
Reprints of the information on this page are available for the asking.

2. Fill Cone in 3 Layers



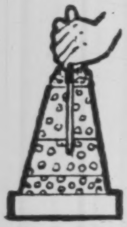
Fill the cone 1/3 full and rod layer exactly 25 times with a round, bullet-nosed iron or steel rod of 5/8″ diameter. Rod uniformly over the entire concrete layer.

3. Use Bullet-Nose 5/8″ Rod



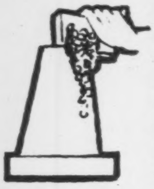
Fill the cone with the second layer until 2/3 full and rod this layer 25 times uniformly over the entire concrete surface, penetrating into but not through the first or bottom layer.

4. Rod Each Layer 25 Times Uniformly



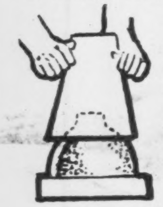
Fill the cone until it slightly overflows and then rod this top layer 25 times uniformly, penetrating into but not through the second layer.

5. Strike Off Excess Concrete



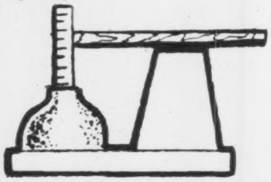
Strike off excess concrete from the top with a straightedge so that the cone is exactly full. Remove spilled concrete from around the bottom of the cone.

6. Remove Cone Carefully



Lift cone straight up, slowly and gently, immediately after filling, rodding and strike-off are completed. Never jar the concrete at this point.

7. Measure Slump From Bottom of Straightedge



Measure the slump as shown above. If the top of the slump is irregular, do not measure the high point or the low point. Try to get the average. Caution: Never reuse this concrete for cylinder strength tests.

Recommended Slumps for Various Types of Construction*

Type of Construction	Slump inches**	
	Maximum	Minimum
Reinforced foundation walls and footings, and thin plain walls	5	2
Plain footings, caissons, and substructure walls	4	1
Slabs, beams, and reinforced walls	6	3
Building columns	6	3
Pavements	3	2
Heavy mass construction	3	1

*Adapted from Table 4 of the 1940 Joint Committee "Report on Recommended Practice and Standard Specifications for Concrete and Reinforced Concrete."

**When high-frequency vibrators are used, the values given should be reduced about one-third.

ALPHA
PORTLAND CEMENT COMPANY
Alpha Building, Easton, Pa.

Missile Commission Starts to Work

- **Mediators get indoctrination course on missile disputes and on available settlement machinery.**
- **A number of general and specific complaints are under investigation by committee staff members.**

In a series of quiet but determined moves last week, the Kennedy Administration began to come to grips with the troublesome labor problems at the nation's missile sites.

These were the first steps taken so far to put to work the Administration's formula for preventing further missile-base work stoppages which, over a three-year period, have resulted in 327 strikes and a loss of more than 160,000 man-days of work. President Kennedy has warned that "uninterrupted and economical operations at missile and space sites are imperative."

In issuing the warning several weeks ago, the President named an 11-man tripartite Missile Sites Labor Commission to forestall any further missile-base labor troubles. At the same time, the commission chairman, Labor Secretary Arthur J. Goldberg, secured a "no-strike" pledge from labor leaders, contractors and manufacturers working on missile projects.

Thus armed, the Administration last week:

- Assembled 25 top-flight federal mediators who were assigned to the missile bases for a four-day refresher course on the special problems involved in missile-base construction and the tools to be used in solving them.
- The Missile Sites Labor Commission began investigation of four critical issues that have caused troubles for the missile program in the past—and still linger to threaten further problems in the future.

Actually, despite a White House directive to terminate the interruptions and uneconomical practices at missile sites and the "no-strike" pledges of the participants, there is nothing in the peace package that assures this will happen. This must be worked out at the sites between the parties involved—labor, management and the government.

Last week was the start. In the meetings of mediators, headed by Federal Mediation and Conciliation Director William E. Simkin, the participants reviewed the methods to be used to resolve labor conflicts—i.e., the operations of the various jurisdictional boards for craft and industrial unions, the workings of the National Labor Relations Board, and so on.

As one government official explained it: "We told them what they have to deal with. They won't be just mediators. They have to seek out problems. They have to handle jurisdictional and grievance problems, which they aren't used to. They have to aggressively develop a sense of emergency. These are sensitive problems."

The mediators will be in the front line of the government's missile-base labor program, not only assigned to the specific site as on-the-spot mediators but as members of special tripartite committees to be named by the commission to handle specific labor troubles when they break out.

The commission itself takes on the broad problems. So far, after two sessions, the commission agenda has four of the toughest:

- The Defense Department has handed the commission a series of complaints of "uneconomical practices" at missile sites covering not only work stoppages but overtime pay, extra subsidence payments and other practices involving labor unions.
- The National Aeronautics and Space Administration has turned over to the commission its report on jurisdictional disputes between craft and industrial unions over work assignments at missile bases—particularly the feuding between the two labor groups over the jurisdictional lines between construction and manufacturing work at the missile sites.
- The Air Force has complained to the commission about a newly negotiated contract between the International Brotherhood of Electrical Workers and the Electrical Contractors Association at Cape Canaveral, Fla. The contract provides an extra $5 daily payment for electrical workers in lieu of overtime work. The Air Force charged the agreement was "not satisfactory."
- In addition, the commission has taken on one of the most troublesome jurisdictional contests. The dispute is between the IBEW and operating engineers over installation of cables in missile-base work. This issue is unsettled despite an award in favor of the engineers from the National Joint Board for the Settlement of Jurisdictional Disputes. "This is coming into our situation at every site," says a commission spokesman.

The Administration is counting on several factors, besides the commission itself, to prevent further labor outbreaks. One is the McClellan committee of the Senate, which has focused public attention on the problem through a series of public hearings. The investigations are continuing.

In addition, with the parties involved giving a no-strike pledge, the Administration's labor experts believe that any outbreak in the face of a White House directive, would evoke enough public pressure on the participants to require a quick termination.

Portland Sheet Metal JAC Wins 1961 Training Award

The Portland Sheet Metal Joint Apprenticeship Committee in Portland, Ore., has won the sheet metal industry's 1961 award for outstanding contributions to apprenticeship training.

The award was made in conjunction with the 1961 National Apprenticeship Contest sponsored by the Steet Metal Workers International Association (AFL-CIO) and the Sheet Metal & Air Conditioning Contractors National Association.

Contest winner among the fourth-year apprentices was Frank S. Malle, Jr., of Baltimore, Md. Mr. Malle is a member of Local 122. He is employed by H. E. Crook Co.

First-place winners in the other three apprentice classes were:

- Third year—Albert Blauw, Local 35, Grand Rapids, Mich. His employer is Holwerda Huizinga Co.
- Second year—John Bogdany, a member of Local 39 in South Norwalk, Conn., and an employee of the New Canaan Sheet Metal Co.
- First year—Daniel Groeschel, who belongs to Local 362 in Fond du Lac, Wis., and who works for Jacob Brenner Co.

The award won by the Portland JAC is given annually to the local committee that has done the most to advance the aims and programs of the sheet metal industry in the apprenticeship field.

New Contracts End Two Long Strikes

Stalemates in New York and Connecticut produced little interest in use of Joint Appeals Board

The multimillion-dollar construction industries in eastern New York and Central Connecticut started rolling against last week after two long and costly strikes.

In both strikes, the cost of contractor victories on some of the specific issues ran high. But the hardships encountered and the economic waste involved failed to inspire any great desire to use or adopt the industry's new disputes settlement machinery, known as the Joint Appeals Board (ENR May 18, p. 219).

The New York shutdown, which had dragged on for 32 days in 10 counties, ended with a two-year, 32-cent contract that gives Troy plumbers a 17-cent raise this year and 15 cents next year. In Connecticut, a four-year, 60-cent pact with Hartford and New Britain laborers unshackled $100 million worth of projects closed down for 59 days.

The New York negotiations were the most significant from the labor relations point of view. They gave local contractors, now united under the banner of a geographically broad association, their first major experience with area-wide bargaining.

The negotiations were conducted by the Eastern New York Construction Employers, Inc. The association was formed in 1958 by the merger of the three local Builders' Exchanges in Albany, Troy and Schenectady.

Looking back over the 1961 negotiations, which also involved a strike by operating engineers, Leon J. Kromer, Jr., managing director of the association, said contractors had achieved some of their aims.

Area agreements, for example, have been negotiated with bricklayers, laborers and carpenters. Standardization of rates over a period of time has been built into the contracts and the geographical interchange of workers has been facilitated. In general, the mobility of contractors has been improved and the road to a master labor agreement has been paved, at least in part.

Mr. Kromer said the settlements to date are generally "reasonable." He considered the new wage scales about "in the middle" of the new state averages.

The existence of the new association, Mr. Kromer indicated, has materially strengthened the employers' bargaining position and has resulted, for example, in successful resistance of union demands for a shorter workweek with no loss of pay.

In the central Connecticut strike against members of the Hartford General Contractors Association, the Hartford-New Britain laborers gave in on their three principal demands—an exclusive hiring hall, a subcontractor clause and separate welfare funds:

- Under the contract, contractors must regard the union as a "prime source" of labor but can hire workers, including nonunion men, elsewhere if the union is not able to furnish union workers. Nonunion workers are subject to an eight-day union shop clause.
- The contractors have agreed to hire union subcontractors when available. Demolition and landscape subcontractors in the area, however, are not unionized and will continue to work for the prime contractors.
- Members of the laborers locals will remain in the Connecticut Building Trades Welfare Insurance Fund.

The laborers' scale, formerly $2.80, is increased immediately by 15 cents. Additional increases of 10 cents each are due on April 1, 1962, and April 1, 1963, followed by a 15-cent boost April 1, 1964. Contractors will also contribute 10 cents an hour to a pension fund, effective April 1, 1962.

The 59-day strike is estimated to have cost more than $6 million in lost wages. Contractor and supplier losses are said to have been "tremendous."

Although the facilities of the Joint Appeals Board as an alternative to strikes were available in the strikes by basic trades, JAB's use was not proposed at all in the upstate New York negotiations. The Connecticut laborers volunteered to use the board but the contractors rejected the offer. It was felt in both situations that the proper place to reach a settlement is at the local level. None of the new contracts with the basic trades provides for the use of JAB in the future.

School Bill Stirs Wage Feud

A Davis-Bacon prevailing wage provision in the school construction bill now before Congress is strongly opposed by the Chamber of Commerce.

"The inclusion of the Davis-Bacon Act in legislation providing for federal control of education makes it imperative that you telegraph, telephone or write your Congressmen and Senators to defeat S. 1021 or H. R. 7300," the Chamber has told its members.

The school bill provides that wages on construction work financed "in whole or in part" under the provisions of the bill shall be not less than those "prevailing on similar construction in the locality" as determined by the Secretary of Labor. Unlike other Davis-Bacon clauses, the bill also requires the payment of overtime at "not less than one- and one-half times" the basic rate for all hours in excess of eight a day or 40 a week.

The Chamber has long contended that the Davis-Bacon Act has outlived its usefulness and that it should be repealed. It accuses the Labor Department of using union wage scales as guideposts and of relying on out-of-town or metropolitan criteria that lead to wage determinations higher than local wage levels.

"Pay levels are forced up artificially," the Chamber says, and taxpayers are saddled with excessive construction costs of "staggering" proportions. One of the results, it adds, is that the law "spurs runaway inflation."

Building Trades Score Representation Victory

The National Labor Relations Board has given the green light to separate crews of skilled maintenance workers to choose a union other than a plant production union to represent them. The result is a victory for the building trades.

In a four-to-one decision, reversing a ruling of the old Eisenhower-appointed Board, the new NLRB said that the introduction of automation and new techniques in industrial plants has separated maintenance work from production work. Where this is the case, said the Board, the maintenance workers can be represented by separate unions if they choose.

With new Board members, Chairman Frank McCulloch and member Gerald A. Brown leading a four-man majority, the NLRB granted the Pensacola Building and Construction Trades Council the right to a separate place on a representation ballot at American Cyanamid Co.'s plant located at Milton, Fla.

RUST-OLEUM®
STOPS RUST!®
and matches ORIGINAL EQUIPMENT
COLORS

RUST-OLEUM
STOPS
RUST!

Distinctive as your own fingerprint. Accept no substitute.

How much does rusty equipment cost *you?* With Rust-Oleum, you STOP RUST—and you match original equipment colors, too, for long-lasting protection! Words are fine . . . but we want you to actually take the brush and see for yourself how *easy* it is to use Rust-Oleum . . . see how it dries to an *attractive, high-gloss finish* that resists rain, snow, sun, fumes, heat, road grime, and blowing dust and sand. And the same formula can be applied by hot or cold spray. Just check off the color you desire on the coupon and attach it to your business letterhead for a FREE TEST SAMPLE. No cost or obligation.

Your Rust-Oleum Industrial Distributor maintains complete stocks for immediate delivery.

ATTACH COUPON TO YOUR BUSINESS LETTERHEAD FOR FREE TEST SAMPLE

CHECK COLOR TO MATCH YOUR EQUIPMENT

RUST-OLEUM CORPORATION, 2513 Oakton St., Evanston, Ill.

Please send me a FREE TEST SAMPLE in the color checked:

☐ 769 Damp-Proof Red Primer
☐ H-5 Black
☐ 2766 White

ALLIS-CHALMERS
☐ H-1 Orange

J. I. CASE
☐ H-6 Flambeau Red
☐ H-28 Desert Sunset

CATERPILLAR
☐ H-4 Yellow

JOHN DEERE
☐ H-3 Green
☐ H-10 Yellow

MASSEY-HARRIS
☐ H-18 Yellow
☐ H-19 Red
☐ H-23 Straw Yellow

OLIVER
☐ H-12 Green
☐ H-13 Red

EUCLID
☐ H-9 Green
☐ H-27 Light Green

FORD
☐ H-20 Gray
☐ H-21 Red

MINNEAPOLIS-MOLINE
☐ H-16 New Prairie Gold

FERGUSON
☐ H-7 Gray

INTERNATIONAL
☐ H-2 Red
☐ H-8 Blue
☐ H-15 Green

Court Holds Burt Boycott Is Illegal

Difficulties faced by court show why employers want a stronger, not a weaker, boycott ban

The sheet metal workers' refusal to install ventilators, made by members of the steelworkers union at Burt Manufacturing Co. in Akron, Ohio, was illegal—and still is under the Landrum-Griffin labor law.

In writing another chapter to years of pedantic litigation, the District of Columbia Court of Appeals has reaffirmed, at least in principle, the law's protection of contractors against product boycotts that extend factory labor disputes to construction sites.

The court ruled that various on-site work stoppages in protest against the use of Burt sheet metal products were illegal on two grounds: They sought to force owners and contractors not involved in the union's dispute with Burt to quit doing business with Burt. And they violated the rights of Burt employees by putting pressure on Burt to recognize the uncertified sheet metal workers union as bargaining agent for its workers.

The decision adds nothing new to the law's interpretation. But the fact that it took 15 years to get a responsible decision helps explain why contractors, who are usually in a vulnerable position, are so touchy about any efforts to relax the boycott ban.

The significance of the Burt dispute lies in the fact that it is not a construction industry dispute at all.

It is a jurisdictional fight between two unions—the steelworkers who legally represent Burt employees, and the sheet metal workers who claim jurisdiction over the workers and who want to become their bargaining agent.

The sheet metal workers have used the product boycott in an effort to organize Burt from the top down without going through the standard certification procedures of the law. The AFL-CIO, which tried unsuccessfully to end the dispute, accused the sheet metal workers of trying to raid the steelworkers. Contractors, caught in the middle, have been innocent victims of this fratricidal warfare.

The protection of the law has been slow in coming because illegal boycotts are often difficult to identify and hard to prove.

Ever since the Denver Building Trades case, some kind of a line has been known to exist—but not where—between lawful primary pressures and unlawful secondary ones. Citing the Denver case, the Court of Appeals said Congress intended "to protect unoffending employers and others from pressures in controversies not their own, without limiting the right of labor organizations to exert pressure on employers in primary labor disputes."

Even if a union's tactics are considered secondary under this approach, the next hurdle is proof that they violate the letter as well as the spirit of the law. What, for example, is a "concerted refusal" to perform services? This was one of the problems the Court of Appeals strained to overcome in the Burt case.

The question of the international's liability for the boycotts presented the same kind of slippery problem. Here, the court found that the union's jurisdictional claim over "all sheet metal work made with No. Ten (10) U.S., its equivalent or lighter gauge metals" had been "construed and applied by the international and the locals as precluding contracting employers from using sheet metal items fabricated by anyone other than their employees or employees of another employer under contract with the sheet metal workers."

Under common law rules of agency, which make a principal responsible for the acts of his agents, this was enough to make the international guilty of the boycotts, too, the court concluded. The fact that the international had ordered the locals to comply with the jurisdictional mandate without "inducing employees to refuse to handle Burt's products," the court said, did not insulate the international from liability.

Labor in Brief . . .

• Wage ordinance approved—The Court of Common Pleas in Philadelphia, has upheld a city ordinance requiring the payment of prevailing wages on city construction projects. Rejecting the arguments of a contractor who filed the suit, the court said the ordinance is reasonable.

• Two-year pacts—New labor contracts give painters and cement masons in Niagara Falls, N. Y., a 35-cent wage boost spread over two years. They got a 15-cent hike June 15, with subsequent increases of 5, 10 and 5 cents.

• Another approach? — AFL-CIO President George Meany, who admits that racial discrimination by some unions is a problem, has urged all international unions to consider giving summer office employment to African students. If necessary, the AFL-CIO will meet half the cost.

• TVA pay boost—Engineering, scientific and other non-management "white collar" workers at Tennessee Valley Authority will get annual salary increases ranging from $125 to $400, and averaging 3.5%. Highest increases will go to those in engineering, scientific and administrative positions. About 6,200 workers are affected.

• Wages and prices—President Kennedy's Advisory Committee on Labor-Management Policy is expected to get into the controversial question of wage and price policies at its next meeting, July 10 and 11. Administration officials are beginning to emphasize the need for voluntary restraint by labor and business concerns.

• Substantial increase—Roofers in a 20-county western Pennsylvania area have a new three-year, 60-cent wage pact. Wages go up 55 cents in five steps—15, 10, 10, 10, and 10 cents. Health and welfare will be upped from 10 to 15 cents in two steps of 2½ cents each.

• Reorganization plan—The Chamber of Commerce has urged Congress to reject President Kennedy's plan to decentralize the National Labor Relations Board by giving some finality to trial examiners' decisions. The plan would impinge on the right to full legal process, the Chamber said.

• Injuries down—The construction industry was one of the few that improved its injury record last year, according to the U. S. Labor Department. Preliminary data indicate the injury rate dropped 4 or 5%.

Construction Employment Shows Slow Improvement

Construction employment is moving out of the recession doldrums. But the progress is slow and the U.S. Labor Department can see "no clear trend" in the changes that have occurred during the past year.

The number of workers employed in the industry rose about 150,000 last month to 2,755,000.

The increase was less than normal for the period and the May total was 75,000 below that of a year ago. The gains during the previous two months, however, had been better than seasonal.

The figures are part of the department's monthly employment report, which revealed that the seasonally adjusted rate of unemployment for the nation as a whole—now 6.9%—has changed little in six months.

Although there was a strong pickup in heavy industrial employment last month, most of the changes were seasonal. Total employment was up to 66.8 million, and unemployment was down to 4.8 million.

Long-term unemployment, which stood at 1.9 million, hit a postwar high for May. This figure includes those who have been without jobs for 15 weeks, or longer. Of these, nearly a million have been jobless for more than half a year.

Professional Group Urges A Change in Labor Law

The federal labor law, or its administration, should be changed to make it easier for professional employees to get out from under union representation, according to the National Society of Professional Engineers.

In testimony before a House Labor subcommittee investigating National Labor Relations Board operations, NSPE Executive Director Paul H. Robbins criticized the Board for no longer giving professionals in mixed bargaining units a separate vote on decertification.

The result of the Board policy, Mr. Robbins said, is that engineers and other professionals can remain "submerged against their will in a collective bargaining unit which could be insensitive to their particular needs and requirements."

Mr. Robbins urged that the Board revise its policy of refusing professionals a separate decertification election. And he said the NSPE favors an amendment that would clarify the Taft-Hartley decertification provisions to assure professional workers a voice of their own on continued union representation.

OFFICIAL PROPOSALS

RATE: The rate for official Proposal advertising is $2.70 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.

CLOSING DATE: Friday 10:30 A.M. for issue dated the following Thursday.
See filler on page 312

SEND COPY TO: Official Proposal Division, Engineering News-Record
Class. Adv. Div., P. O. Box 12, N. Y. 36, N. Y.

Bids: July 19, 1961

Elizabeth River Tunnel Commission Norfolk, Virginia

Sealed proposals for CONTRACT NO. 3, Norfolk Approach of the SECOND ELIZABETH RIVER TUNNEL and APPROACHES, will be received by the Elizabeth River Tunnel Commission at the City Council Chamber, City Hall Building, 235 East Plume Street, Norfolk, Virginia, until 2 P.M. (EST) Wednesday, July 19, 1961, at which time and place the bids will be publicly opened and read aloud.

Contract No. 3 consists essentially of an interchange to local city streets, including off and on ramps; the construction of grade separation structures, the construction of service roads; relocating of city streets; construction of drainage facilities and culvert structures; guard rail and fences, topsoiling, seeding and planting; all in the near vicinity of the Norfolk portal of the Second Elizabeth River Tunnel.

The proposal and the plans provide for three Schedules for the work, and Bidders are required to submit bids on all three.

On and after June 29, 1961, Plans and Specifications may be viewed at the office of the Commission at the Administration Building, Berkley, Norfolk, Virginia, and may be viewed and purchased at the office of the Engineer, Parsons, Brinckerhoff, Quade & Douglas, 165 Broadway, New York 6, New York, upon payment of $35.00 per set. Additional sets of Plans will cost $30.00; and additional copies of Specifications will cost $5.00. *DOCUMENTS ARE NON-RETURNABLE FOR REFUND.* The Specifications, consisting of the Standard Specifications (Virginia Department of Highways, Road and Bridge Specifications, April 1, 1958 Edition), and the Special Provisions will include copies of the Proposal form, Proposal Bond form, Contract form, and Contract Bond form. Also furnished in the Contract Document Set will be pertinent sheets from the Road Designs and Standards of the Department of Highways. Any and all other pertinent information may be obtained at the New York office of Parsons, Brinckerhoff, Quade & Douglas.

Bidders are required by law to be registered with the State Registration Board for Contractors in Virginia.

A Proposal Bond, prepared in the form furnished, will be required of the bidder, in the amount of not less than twenty per cent (20%) of the highest aggregate bid for all work performed under Schedule 1, 2, or 3, of CONTRACT NO. 3.

The Elizabeth River Tunnel Commission reserves the right to make award on either Schedule 1, 2 or 3, or to reject any and all proposals.

Bids: June 28, 1961

Triborough Bridge and Tunnel Authority

SEALED BIDS WILL BE RECEIVED BY Triborough Bridge and Tunnel Authority at its office, Administration Building, Randall's Island, Manhattan, New York 35, N. Y., as follows:
Until 11 A.M. Wednesday, June 28, 1961

For Narrows Bridge Contract No. NB-6, Suspended Structure and Decks on Anchorages. Work includes the steelwork and concrete paving for a two level suspended structure at the entrance to New York Harbor.

Each bid must be accompanied by a deposit in the amount of $500,000.00.

Plans, specifications and contract documents may be purchased at the office of the Authority for $100.00, which will not be refunded.

Bids: July 20, 1961

Contract #3—General Construction Work
Contract #4—Heating Work
Contract #5—Plumbing Work
Contract #6—Electrical Work

INVITATION FOR BIDS

The Syracuse Housing Authority will receive separate sealed bids for the following contracts for work to be done in the construction of Project NY 1-4 in Syracuse, New York:

Such bids shall be received until 2 P.M. (Eastern Daylight Saving Time) on the 20th day of July, 1961, in the COMMON COUNCIL CHAMBERS, CITY HALL, SYRACUSE, NEW YORK, at which time and place all bids will be publicly opened and read aloud providing more than one bid for each contract is received.

Proposed forms of contract documents, including plans and specifications, are on file at the office of Syracuse Housing Authority at 1001 Almond St., Syracuse 3, N. Y., and at the office of Ketcham-Miller-Arnold, Architects, 1208 James Street, Syracuse 3, New York, and at

Syracuse Builders Exchange, 1045 James St., Syracuse 3, N. Y.
F. W. Dodge Corporation, 119 W. 40th St., New York 18, N. Y.
F. W. Dodge Corporation, 70 Niagara St., Buffalo, N. Y.
Rochester Builders Exchange, 135 Spring St., Rochester, N. Y.
Brown's Letters, Inc., 101 Park Ave., New York, N. Y.
Dow Service, 420 Lexington Ave., New York, N. Y.

Copies of the documents may be obtained by paying Fifty Dollars ($50.00) on or after 20 June 1961, with the Syracuse Housing Authority for each set of documents so obtained. Such documents will become the property of the prospective bidder and no refund of any kind will be made by the Authority on account of such payment.

A certified check or bank draft, payable to the Syracuse Housing Authority, U. S. Government bonds, or a satisfactory bid bond executed by the bidder and acceptable sureties in an amount equal to five percent of the bid shall be submitted with each bid. The successful bidder will be required to furnish and pay for satisfactory performance and payment bond or bonds.

Attention is called to the fact that not less than the minimum salaries and wages as set forth in the Specifications must be paid on this project.

The Syracuse Housing Authority reserves the right to reject any or all bids or to waive any informalities in the bidding.

No bid shall be withdrawn for a period of forty-five days (45) subsequent to the opening of bids without the consent of the Syracuse Housing Authority.

SYRACUSE HOUSING AUTHORITY
BY Jacob C. Lattif, Chairman
Dated: 19 June, 1961.

District of Columbia—Pumping Station—Dept. of Sanitary Eng., D. C., June 7, 1961. CONSTRUCTION OF "O" STREET SEWAGE PUMPING STATION, "O" and Canal Sts., S.E. (Invitation No. C-61100-S), consisting of furnish. all labor, materials, and equip. necessary and performing all work required for the constr. of the pumping station, furnish. and install. equipment and all other appurtenant work. (Wage rates have been predetermined by Labor Dept.) Bid forms, plans and specifications are now available from Supervisor, Bid & Contract Division, Procurement Office, D. C., Room 404, 499 Pa. Ave., N.W., upon deposit of a certified check for $50.00 per set, payable to D. C. Treasurer, (Phone NA 8-6000, Ext. 448). SEALED BIDS to be opened 3:00 PM, EDT, June 29, 1961, in Rm. 424, 499 Pa. Ave., N.W.

Bids: June 30, 1961

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y., Pursuant to the provisions of the Highway Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time, which is nine-thirty o'clock A.M., eastern standard time, on the 30th day of June 1961, by Henry A. Cohen, Director, Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

E. E. Towlson, Dist. Engr., 333 E. Washington St., Syracuse, N. Y.
OSWEGO COUNTY

Contract No.	Type	Name of Highway & Miles	Deposit For Plans	Bid Deposit	Dept. Est.
FIM. 61-1	Plastic Pavement Marking	Int. Rte. 505 Brewerton-Central Square FISH. 57-3 FISH. 58-9 Central Square-Parish FISH. 58-26 3.64 Miles	$5	$1,400	$25,000

Any projects in this letting that are on the Federal Aid highway systems are subject to the provisions of the "Federal Aid Highway Act. of 1956", being Public Law 627, 84th Congress, approved June 29, 1956, and are also subject to the applicable New York State statutes.

In compliance with the provisions of Section 115 (Prevailing Rate of Wage), Public Law 627, the minimum wages to be paid laborers and mechanics are included in wage schedules that are set out in the bid proposal.

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

If the deposit is $10.00 or more, full refund for one copy of the plans and specifications will be made to a bidder for the particular project, if such plans and specifications are returned in good condition within 30 days after the award of the contract or after the rejection of the proposal. The successful bidder is not required to return the copy of the plans and specifications in order to be entitled to such refund. If the deposit is $10.00 or more, partial refund will be made for the return of all other copies of plans and specifications in good condition within 30 days after the award of the contract or the rejection of the proposal.

Special attention of bidders is called to "Information for Bidders" in the Public Works Specifications, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as Amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Department of Public Works" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bid deposit, the execution of the contract, and bond shall conform to the provisions of the Highway Law, as set forth in the "Information for Bidders".
The right is reserved to reject any or all bids.

J. BURCH McMORRAN
SUPT. OF PUBLIC WORKS

District of Columbia—Building Construction—Dept. of Buildings & Grounds, D. C., June 6, 1961. CONSTRUCTION OF NEW ELEMENTARY SCHOOL, 4th and W Sts., N.W., Washington, D. C. (Invitation No. C-61151-B). Wage rates have been predetermined by Labor Dept. Bid forms, plans and specifications are now available from Supervisor, Bid & Contract Division, Procurement Office, D. C., Room 404, 499 Penn. Ave., N.W., upon deposit of a certified check for $75.00 per set, payable to D. C. Treasurer, (Phone NA 8-6000, Ext. 448). SEALED BIDS to be opened 3:00 PM, EDT, July 11, 1961, in Room 424, 499 Penn. Ave., N.W.

Bids: June 29, 1961

New York State Road Work

NOTICE TO CONTRACTORS
STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Highway Law, sealed proposals will be received until 10:30 a.m., Advanced Eastern Standard Time, on June 29, 1961, by Henry A. Cohen, Director, Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for:

SOIL EXPLORATIONS AND FOUNDATION INVESTIGATIONS AT VARIOUS SITES ON INTERSTATE ROUTE 505, EAST GLEN AVENUE TO SIZER STREET, NEW PROJECT NO. 1-81-2(22)77, OLD PROJECT NO. 1-1127(6), ITEM 72B, CITY OF SYRACUSE, ONONDAGA COUNTY, WHICH CONSTITUTES CONTRACT SPEC. NO. FA-SM-183.

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, New York.
(b) Mr. Earl E. Towlson, District Engineer, New York State Department of Public Works, 333 East Washington Street, Syracuse, New York.
(c) Mr. William Mende, Principal Building Construction Engineer, Department of Public Works, 270 Broadway, New York City.

The deposit for a set of plans, specifications and proposal forms is $5.00. Refunds of deposits for plans, specifications and proposals will be made only in case the deposits of individual sets are $10.00 or more, per Chapter 835, Laws of 1960.

The Engineer's Estimate of cost for this work is $19,110.00.

Proposal for this contract must be submitted in separate sealed envelope with the name of the contract plainly endorsed on the outside of the envelope. Proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Department of Public Works" for the sum of $1,000.00. The retention and disposal of the bidding check the execution of the contract and bonds shall conform to the provisions of the Highway Law as set forth in "Instruction to Bidders."

The right is reserved to reject any or all bids.

J. BURCH McMORRAN
SUPERINTENDENT OF PUBLIC WORKS

Bids: July 20 and July 27, 1961

The Port of New York Authority

ADVERTISEMENT

Sealed proposals for the following work will be received at the Office of the Chief Engineer, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on date indicated, at which time said proposals will be opened and read in Room 1108.

Contract NYA-340.006—New York International Airport—Central Heating and Refrigeration Plant — Expansion — Deposit $100.00 per set of documents—Bids will be received until 2:30 P.M. on Thursday, July 20, 1961.

Contract GWB-190.039—George Washington Bridge—Lower Level Expansion—New Jersey Approach—Center Avenue Bridge Alteration Over Upper Level Roadway—Deposit $30.00 per set of documents—Bids will be received until 2:30 P.M. on Thursday, July 27, 1961.

Contract EP-110.010—Elizabeth-Port Authority Piers—Buildings 121, 122, 125 and 126—Deposit $30.00 per set of documents—Bids will be received until 2:30 P.M. on Thursday, July 20, 1961.

Contract documents may be seen at the Office of the Assistant Chief Engineer for Design, Room 1115, 111 Eighth Avenue, New York 11, N. Y. Documents will be furnished upon receipt of the above deposit (each set including one copy of the Contract Drawings) for not more than three sets to any one company. Additional sets will be furnished upon payment of an amount for each set equal to the deposit indicated above, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract directly to the Authority will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a

bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
S. Sloan Colt, Chairman
New York, June 22, 1961

NOTICE to ADVERTISERS

Because of the Holiday, Independence Day, the "Searchlight" pages of

ENGINEERING NEWS-RECORD

Close for press earlier than the usual weekly closing time.

The cooperation of advertisers is solicited in forwarding new copy, or changes of copy, to reach us accordingly.

Display and Undisplayed Ads

FINAL CLOSING TIME

July 6th issue closes June 26th
July 13th issue closes June 30th

PROPOSALS

July 6th issue closes June 29th
July 13th issue closes July 7th

ADDRESS BOX NO. REPLIES TO: Box No.
Classified Adv. Div. of this publication.
Send to office nearest you.
NEW YORK 36: P. O. Box 12
CHICAGO 11: 645 N. Michigan Ave.
SAN FRANCISCO 11: 255 California St.

• POSITIONS VACANT

Structural Engineer-Midwest consulting firm seeks Ph.D. to design complex steel structures, reinforced and prestressed concrete. Preference will be given to applicants with practical experience. Permanent position with established firm in business since 1929. Moving expenses paid. Send resume, including education, experience, and personal qualifications to P-6245. Engineering News-Record.

Chief Estimator—Leading West Coast contractor has an opening for a top man with 10 to 15 years heavy construction estimating and a minimum of 5 years field experience. Applicant must have been part of a construction company Management Staff, and a portion of his experience must have been in the Western States. Salary is open, with excellent opportunity for the right man. P-6795, Engineering News-Record.

Detailers—Struct. steel—experienced only. David Zarin & Assoc., Harborside Term. Bldg., 34 Exch. Pl., Jersey City, N. J., HE 4-4411.

Graduate Engineer—Estimator for Heavy Construction such as sewers, waterlines, bridges and dams. Permanent. Location Ohio. P-6819, Engineering News-Record.

Soils and foundation engineer—recent graduate—Masters Degree, design and construction experience desirable. Salary open. Location Southwest. Write P-6838, Engineering News-Record.

Sanitary Engineer with extensive experience in preliminary engineering, detailed design, general overall supervision or client contact on sanitary projects. Submit complete resume of education, experience, and qualifications, together with salary requirements. Stanley Engineering Company: Muscatine, Iowa.

Electrical, Mechanical Engineers—Minimum 5 years experience in grain elevators. Must be college graduate and preferably licensed, capable of handling Electrical and Mechanical Engineering Department for established engineering firm in South. State salary expected, etc. Reply in writing to P-6867, Engineering News-Record.

Trade Association Director. Engineering Degree required. P. E. License desired. Experienced in design, control & placement of bituminous mixes. Able to work with public officials, handle office, write fluently, etc. Will consider unusually mature 30 & up to 50 years. Location—South. P-6886, Engineering News-Record.

Civil Engineer ($7360-$8910)—A challenging opportunity is offered for a qualified civil engineer interested in applying his training and experience to engineering personnel selection. No specialized experience is required. You will be trained on the job. An opening for a Civil Engineering Examiner is available in the New York State Department of Civil Service at Albany, N. Y. In order to qualify, you must have an acceptable bachelor's degree in civil engineering and at least two years of civil engineering experience, or two years of experience teaching civil engineering subjects in a recognized college, or an equivalent of the above. The salary is $7360 to $8910, for a 5-day, 37½-hour week, with substantial fringe benefits. Qualified applicants are invited to send detailed resumes to Dept. of Civil Service, Recruitment Unit, Box 10B, The State Campus, Albany, N. Y.

Asphalt and Concrete Paving Superintendent. All types of municipal paving. Northern Construction Company, P.O. Box 70, Grand Forks, N. Dak.

Graduate Civil Engineer. Westchester County, N. Y. office of large firm. Quantity take-off, etc. Permanent position with excellent opportunity. Young man preferred. Experience not necessary. P-6898, Engineering News-Record.

Expressway Design Engineer — Southeast Consulting Firm. Capable of developing design from preliminary to final. Permanent position in expanding firm. Salary commensurate with ability. Send complete resume to P-6903, Engineering News-Record.

(Continued on the following page)

VICE-PRESIDENT

SD PLANTS, an active construction company in the chemical construction and allied fields, has opening for Manager of Construction leading to a position of Vice-President. Applicant should have mechanical, civil or chemical engineering degree, field and office experience in chemical plant design and construction. Must be knowledgeable in field of labor, sub-contracts, construction equipment, supervision and management functions. Salary open and commensurate with experience.

Send reply with full details of training, experience and salary requirement in confidence to:

P. S. MONROE

SD PLANTS INCORPORATED

2 Park Avenue, New York 16, N. Y.

PIPE FOUNDRY SALESMAN WANTED

Old established foundry organization producing cast iron pressure pipe and fittings has excellent opportunity for a salesman for South Atlantic territory. Prefer man over 30 with engineering education, experienced in selling pipe or related products to municipalities, contractors, and public utilities. Candidates to qualify must have proven sales ability and growth potential. Replies should offer full details of education, work record, earnings, and availability.

WALLY E. GEORGE, *Management Consultant*
425 Cherry, SE., Grand Rapids 2, Mich.

WANT TO MOVE UP?

Are you a Civil Engineer graduate, between 38 and 48 strong on earth moving; know heavy equipment and concrete construction from field experience and qualified to participate in estimating, scheduling and planning and to follow execution of the work to timely completion within budget? Are you immediately available? If so and you are interested in joining a long established but growing heavy and highway construction company operating in the Great Lakes area, write

P-6909, Engineering News-Record
645 N. Michigan Ave., Chicago 11, Ill.

MARINE FIELD ENGINEERS

OPENINGS: Career opportunities for Marine Field Engineers with nationally known contracting organization. First assignment on Lower Chesapeake Bay Bridge-Tunnel Project at Norfolk, Va. Supervisory position open for right man.

QUALIFICATIONS: Must have experience in heavy marine construction, primarily subaqueous tunnels and bridge foundations. No others need apply.

SALARY: Commensurate with experience and ability.

APPLY: Send complete personal, experience and salary data to:

P-6911, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

GRAVER

has excellent openings for the following list of qualified personnel:

Junior and Senior Estimating Engineers
Stress Analysts (Research)
Chemical Engineers (Research)
Welding Development Engineers
Metallurgical Engineers
Design Engineers (Plate Structures)
Junior and Senior Contracts Engineers

All of the above should hold degrees and their training and experience should be on structural design as related to large plate structures; such as, field erected containers, towers, stacks, etc. Address all applications to: Industrial Relations Department,

GRAVER TANK & MFG. CO.
Division—Union Tank Car Company,
35 East Wacker Drive, Chicago 1, Illinois

STRUCTURAL ENGINEER

Unusual opportunity in Headquarters Staff Engineering Department of nationwide, multiplant chemical company. Midwest location. Should have Mechanical or Civil Engineering degree plus interest, training, and several years' experience in design and construction of plants.

Inspect, design, estimate, recommend, contract, and supervise building construction, installation of equipment, alterations, additions, etc. Responsible for supervision of drafting room employees.

Some travel. Should be licensed in Illinois. Good salary and benefit programs. Submit complete résume and salary desired to

P-6907, Engineering News-Record
645 N. Michigan Ave., Chicago 11, Ill.

EMPLOYMENT OPPORTUNITIES

POSITIONS VACANT
(Continued from preceding page)

Structural Engineer—Southwest engineering firm seeks design engineer, experienced in concrete and steel. Industrial experience required and construction experience desirable. Submit education, experience, qualifications, and salary requirements to: P-6916, Engineering News-Record.

Electrical Engineer—Experienced in supervision of power plant design. Gas turbine, steam turbine, transmission, distribution, and substations. Southwest location. Salary open with excellent opportunity for right man. Submit resume and qualifications to P-6922, Engineering News-Record.

Estimators — Mech., Elec., Arch., Struct. Expd. estimators to prepare & check change orders on construction work. Openings in various locations in U.S.A. Please send complete resume & salary requirements. All replies confidential. P-6929, Engineering News-Record.

The City of Minot, North Dakota requires a construction engineer. Must have four year civil engineering degree. Starting salary $450 to $575. Complete details by writing to City Engineer, Minot, North Dakota or R. E. Barcus, City Auditor.

• SELLING OPPORTUNITY AVAILABLE

English company selling to the Building & Civil Engineering Trades wishes to take on agencies for contractors' plant and machinery for sale in the United Kingdom. Well established in the trade, own outside sales force selling direct to the user. All replies treated in confidence. Manufacturers interested please write RW-6891, Engineering News-Record.

• EMPLOYMENT SERVICE

200-1,000 new positions reported monthly. Get free copy. National Employment Reports, 20 E. Jackson, 902-B, Chicago 4.

• POSITIONS WANTED

Electrical Construction Engineer, age 36, B.S.E.E. '50, (Power), P.E., 7½ years industrial and military construction experience, 6 years overseas, immediately available, desires foreign employment. PW-6828, Engineering News-Record.

Construction Superintendent past retirement but still active desires job as inspector for architect or owner or subordinate job with contractor. PW-6824, Engineering News-Record.

Civil—Sanitary—Presently in charge 54 MGD sewage treatment plant. Varied experience design and city engineering. BS Oregon State MS Georgia Tech. Reg. PE, age 35, Geo. M. Jacobs, 2928 Westmoreland Dr., Nashville, Tenn.

General Superintendent-Proj. Mgr. Hvy Const. roads, bridges, bldgs, flood control tunnels, sewage & sewage disp. Concrete mech. background. PO Box 48 Clayton 5 Mo.

Executive, 16 yrs const exp, capable administrator, mgr. atty, efficient coordinator, govt contracts, female. PW-6853, Engineering News-Record.

Project Manager or superintendent, P.E., eighteen years general and heavy construction experience including operation of self-owned company. Will relocate. PW-6873, Engineering News-Record.

Engineer, BSCE, 25 years experience: Inspection, layout engr. (6 parties), field engr., also asst. to supt. in steam plant, lock, dams, and building construction. Seeks job as field or layout engr. or in related field. Temporary assignment accepted. Age 57. $150 per week. PW-6869, Engineering News-Record.

Civil Eng; many yrs exp in all phases engrd. const; prefer New Eng. or overseas; fluent Spanish & French. PW-6882, Engineering News-Record.

Construction Superintdt. or Gen. Inspector. 40 years exp. Thoroughly experienced in all phases of construction, foundations, roads, buildings, erection & operation of batch, washing, crushing plants, excavations, refineries, gunite work, industrial precast, waterfront. Particularly competent in coordinating all classes of personnel, equipment, private & public works. Domestic and overseas jobs. PW-6890, Engineering News-Record.

• POSITIONS WANTED

General Manager of structural steel fabricating company. Twenty years with large fabricator. Experienced in sales, estimating, pricing, engineering and shop procedure. Graduate engineer. Presently employed. PW-6875, Engineering News-Record.

Technical School Graduate with 8 years experience as estimator. Recently project manager on industrial bldgs., schools, etc. Desires position with general contractor. No objection to travel. Reply PW-6901, Engineering News-Record.

BCE, PE—Age 33. 8 years diversified Civil Engineering (design & supervision) exp, and 2 years HVAC design experience. Seeking position with potential in Greater New York area. PW-6894, Engineering News-Record.

Construction Executive, Bachelor's Degree Civil Engineering, Master's Business Administration, P.E., age 38, 13 years experience from field engineer to Vice President in industrial, commercial and institutional construction. Capable of complete management and/or handling projects from bid to final money. Presently employed. PW-6893, Engineering News-Record.

B.S.B.A., 28, 5 yrs. experience in administration, field supervision and engineering—pipelines, utilities, missile site construction. Desire position in contracts administration or estimating. Resume upon request. PW-6892, Engineering News-Record.

Construction Manager, age 39, BSCE, registered. 15 years diverse experience in heavy construction and industrial maintenance. Estimating, scheduling, field layout and job supervision. Seeks permanent position with aggressive medium-sized general contractor. Available November. PW-6895, Engineering News-Record.

Construction Manager. Age 43. Administrative, technical and practical experience covers 14 years in highways, bridges, reinforced concrete structures, prestressed concrete structures and products, and heavy estimating. Minimum $18,000.00. Adv. PW-6925, Engineering News-Record.

Executive—Purchasing Agent, early 30's, hard working, ambitious. Thoroughly familiar with competitive bidding and soliciting of sub-contractors. Knows how to handle people. PW-6902, Engineering News-Record.

Draftsman—Estimator, 15 years experience, mostly estimating and detailing reinforcing bars and allied products, some architectural, structural and design. PW-6924, Engineering News-Record.

• POSITIONS WANTED

Estimator, Construction Cost Changes a specialty, exp'd with military installations, available immed. domestic or foreign assignment. PW-6885, Engineering News-Record.

MSCE, PE, 17 years varied exp. design, plant eng. construction. Versatile, personable. Bus. adm. training, management exp. seeks challenging position industry or construct. PW-6921, Engineering News-Record.

Arch. draftsman, Mat. estimator, take off. 11 y. exper. abroad (& USAF Base) seeks posit. Kelemen, 2051 Grand Ave., Bronx 53, LU. 4-2418.

Superintendent — Experienced complete supervision, highway construction, excavation, grading, other. Address: PW-6896, Engineering News-Record.

Sewer foreman, Italian, middle age, experienced and capable to handle any situation, is desirous to join a small contractor or a large firm in need of a man with proven money making ability. PW-6920, Engineering News Record.

Construction Engineer, A.B.; M.S. in C.E.; P.E. N.Y., 30, 7 yrs experience in construction engineering, field supervision, estimating, bid preparation for large and small G.C. Desire challenging position in N. Y. area. PW-6931, Engineering News-Record.

NOTICE to ADVERTISERS

Because of the Holiday, Independence Day, the "Searchlight" pages of

ENGINEERING NEWS-RECORD

Close for press earlier than the usual weekly closing time.

The cooperation of advertisers is solicited in forwarding new copy, or changes of copy, to reach us accordingly.

Display and Undisplayed Ads

FINAL CLOSING TIME

July 6th issue closes June 26th
July 13th issue closes June 30th

PROPOSALS

July 6th issue closes June 29th
July 13th issue closes July 7th

SEARCHLIGHT SECTION

CLASSIFIED ADVERTISING

STRUCTURAL ENGINEERING
ARCHITECTURAL ENGINEERING
OUR COURSES of instruction by mail HAVE HELPED THOUSANDS to better positions and to pass State Board Examinations
Forty-eighth year.
Write today without obligation
WILSON *Engineering Corp.*
College House Offices HARVARD SQ., CAMBRIDGE, MASS.

ADDRESS BOX NO. REPLIES TO: Box No.
Classified Adv. Div. of this publication.
Send to office nearest you.
NEW YORK 36: P. O. Box 12
CHICAGO 11: 645 N. Michigan Ave.
SAN FRANCISCO 11: 255 California St.

• SPECIAL SERVICES

Transmission Lines.—Construction Company specialized in the construction of transmission lines up to 330 KV, sub-stations and distributing systems, offers its services as contractors or sub-contractors anywhere in North or South America. SS-6881, Engineering News-Record.

• BUSINESS OPPORTUNITIES

Well-Known Danish consulting engineering firm desires association with U. S. firm for joint work in Africa and the East. One principal M.ASCE with U. S. registration. BO-6927, Engineering News-Record.

• WANTED

Anything within reason that is wanted in the field served by Engineering News-Record can be quickly located through bringing it to the attention of thousands of men whose interest is assured because this is the business paper they read.

CONSTRUCTION SUPERVISION

Exclusive Training Course by mail for top positions. Publishers Manual of Advanced Construction Management. Send postcard for details.

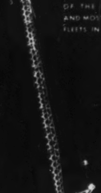
National Schools of Construction
Est. 1952
Satsuma, Florida

WANTED

18" or 20" *Fan Line* for Tunnel, also, Vulcan *Pile Extractor*.

THE FOREST COMPANY
RD1, Mechanicsburg, Pa.   Phone POplar 6-8591

CRANES for RENT



Since 1939
SERVING THE INDUSTRY WITH ONE OF THE LARGEST AND MOST MODERN FLEETS IN AMERICA

Truck Cranes - Crawler Cranes
10 to 60 TONS - 20 to 200 Ft BOOMS
All Attachments
Buckets   Breaker Balls
Jibs   Hooks
HOUR - DAY - WEEK or MONTH
DAY and NIGHT — COAST to COAST
Veteran Operators
INSURANCE TO $1,000,000.00

MOTO-CRANE
SERVICE
KEnwood 3-7570 or ELgin 6-3591
Nights — Royal Oak, LI 1-4135
21250 W. 8 Mile Rd., Detroit, Michigan

THREE AUCTIONS

BANKRUPTCY!!!

CONSTRUCTION EQUIPMENT—CRUSHING EQUIPMENT PAVING EQUIPMENT—CONCRETE PLANTS

PITTSFIELD, BANGOR & FT. FAIRFIELD, MAINE

JULY 7th, 8th & 10th.

NOTICE: This equipment is being sold by order of Hon. Richard E. Poulos, Referee in Bankruptcy, U. S. District Court, District of Maine, in proceedings Nos. 8654 & 8655.

All of this equipment is owned by Joseph R. Cianchette & J. R. Cianchette & Sons Corp., debtors—in possession. It has all been very well maintained and is mostly in very good condition, immediately ready to go to work.

EACH PIECE POSITIVELY SELLS TO THE HIGHEST BIDDER WITHOUT LIMIT, MINIMUM OR RESERVATION!!!

NO CONFIRMATION NECESSARY!!! ***NO BUY-BACKS!!!*** ***NO MINIMUM PRICES!!!***

AUCTION NO. 1: PITTSFIELD, MAINE: FRIDAY, JULY 7, 10 A.M. at J. R. Cianchette & Sons, General Contractors, main office, West edge of Pittsfield.

AUCTION NO. 2: BANGOR, MAINE: SATURDAY, JULY 8, 9:30 A.M. at J. R. Cianchette & Sons shop on Outer Union Street, on West edge of Bangor.

AUCTION NO. 3: FORT FAIRFIELD, MAINE: MONDAY, JULY 10, 10 A.M. at J. R. Cianchette & Sons office & yard 2 miles East of Ft. Fairfield.

(Pittsfield is 30 miles West of Bangor. Fort Fairfield is 150 miles Northeast of Bangor.). *WRITE-WIRE-CALL* Auctioneers for full list of equipment including complete descriptions and locations of all pieces.

INCLUDED WILL BE:

(4) CRUSHING AND WASHING PLANTS

Pioneer 45VE Portable Crusher & all attendant equipment.
(2) Pioneer 173 30x42 Primary Crushers.
Diamond 24x36 & 10x36 Crushers.
Pioneer 54x24 Triple-Roll Crusher.
Symons 4½' Cone Crusher.
(4) Eagle single & twin Screw Washers.
(3) Eagle Scalping Tanks.
Many Vibrating Screens; Conveyors; Bins; Power Units; Generators; Pumps; Feeders; etc.

(5) CEMENT PLANTS — PAVING EQUIPMENT — TRANSIT MIXERS

CMC 97 Ton Automatic Concrete Plant.
Johnson 100 Ton Automatic Concrete Plant.
Noble 150 Ton Automatic Concrete Plant.
Noble 100 Ton Automatic Concrete Plant.
Johnson 100 Ton Automatic Concrete Plant
(2) Smith & CMC 56S Stationary Mixers.
(21) International RF-214 10-Wheel Mixer Trucks with Worthington 7 yard Mixers, new in 1956 & 1958); (4) 4 yard Dumpcretes.
(3) Worthington 34E Dual-Drum Concrete Pavers; (2) Blaw-Knox SD Spreaders; (2) Koehring LF Finishers; Blaw-Knox XE Finisher; (2) Rex Finishers; Quantities of 15x17 & 12x16 Paving Forms; Many other items.

SHOVELS — DRAGLINES — TRUCK CRANES

(2) Northwest 80D Shovels, all with Murphy Diesel power; Northwest 95 Crane with Murphy diesel; (2) Lorain L-80 Shovels with Cat D-13000 power; (2) Bucyrus-Erie 34B & 33B Cranes-Shovels; Lorain L-50K & L-41 Draglines-Shovels; Link-Belt LS-85; (1) Northwest 25TC Truck-Crane with Murphy diesel power; Buckets; Backhoe Fronts for 80D, 25, L-80, L-41; Other Attachments.

TRACTORS — LOADERS

(2) Cat D-9's w/dozers & 1 ripper; (6) Cat D-8's w/dozers; (2) LeT-Westinghouse C Tournatractors; Michigan 180 Turbo-dozer; (2) Michigan 175AD Loaders; Michigan 275AD Loader; Other tractors & loaders.

MOTOR SCRAPERS — WAGONS

(2) Cat DW-20 Motor Scrapers; (2) Cat DW-15 Motor Scrapers; (2) Athey PD-20 Side-Dump Wagons; (3) Cat W-15 Bottom-Dump Wagons.

MISCELLANEOUS

Euclid 5BV Loader; Caldwell Earth Auger on HD Truck; Joy Challenger Drill w/comp. on TD-24; Air Compressors; Ditchers; Rollers; Pumps; Welders; Generators; Shop Equipment; Many other items.

TRUCKS — TRAILERS

(7) 1956 IHC RF-214 10-Wheel Dump Trucks; (15) 1955 IHC RF-214 10-Wheel Dump Trucks; (7) 1954 White WC-2864-OH 10-Wheel Dump Trucks; (18) Other Dump, Tractor & Tank Trucks; (3) IHC Truck-Tractors with Dump Trailers; (3) Low-boys; Other Tank, Van & Moving Trailers; (12) Pickups; (10) Autos.

NOTICE: MOST OF THIS EQUIPMENT, INCLUDING NEARLY ALL OF THE CRUSHING, CONCRETE AND ASPHALT PLANTS AND EQUIPMENT, WAS PURCHASED NEW IN 1956 to 1958. IT HAS BEEN VERY WELL MAINTAINED AND MOST IS IN EXCEPTIONALLY NICE CONDITION. Do not fail to inspect this large spread of very usable equipment and attend these sales on July 7th, 8th & 10th.

EACH PIECE POSITIVELY SELLS REGARDLESS OF PRICE!!! NO CONFIRMATION!!!

WRITE—WIRE—CALL
Auctioneers for full list!!
Inspect any time!!

TERMS:
ON THE SPOT FINANCING
AVAILABLE!!!
Contractors (users) may pay ⅓ down, take 6 to 36 months,
(No Pre-Qualification Necessary)!!!

FORKE BROTHERS
the Auctioneers
321 Sharp Bldg. Lincoln, Nebraska HEmlock 2-1045
— EQUIPMENT AUCTION LEADERSHIP SINCE 1921 —

(Equipment being sold by order of Hon. Richard E. Poulos, Referee in Bankruptcy, U. S. District Court)

J. R. CIANCHETTE & SONS
General Contractors, Owners
Pittsfield, Maine
Ph: HUdson 7-5131

Additional Auction Advertisement on page 317

FOR SALE

1 Model 175A Michigan FRONT END LOADER

16:00x24 Recapped Tires
GM 4-71 Diesel has less than 50 hours since complete overhaul. Late type clutch package. Warranty Offered.

$16,500.00

ILLINOIS CONTRACTORS' MACHINERY, INC.

Rte. 83 & Madison — Elmhurst, Ill.
TErrace 4-700 — TUxedo 9-0871

For Sale

P & H SHOVEL

P & H Model 1055 Standard Shovel. Serial No. 16730 with 3½ C.Y. Bucket. Powered by Caterpillar D-375 Diesel Engine, 36 inch track pads. 1,000 hours since upper works overhauled, zero time since lower works overhauled. Machine is in good operating condition.

Price—As is, Where is—$45,000.00
Located in Colorado

C. F. LYTLE, INC.
1923 Geneva Street, Sioux City, Ia.
Phone: 8-5585

FOR SALE

LIMA—Model 2400 (new 1953) with 110′ boom, 6½ Yd. Bucket, Cat. D-397 diesel, good condition.

ANDERSON EQUIPMENT COMPANY
P.O. Box 427, Bridgeville, Penna.
LEhigh 1-6020

LOW COST INSTALLATION AND OPERATION

CABLEWAYS
IMMEDIATE SHIPMENT
ELECTRIC, STEAM OR DIESEL
CAPACITY 3 TO 20 TONS
SELL, RENT OR BUY

FOR
DAMS
BRIDGES
BREAKWATERS
FILTRATION AND
SEWERAGE PLANTS

FOR
SPEED
ECONOMY
EFFICIENCY
FLOOD SAFETY
LABOR REDUCTION

AMBURSEN DAM CO. INC.
295 MADISON AVE. NEW YORK

BARGAIN!

MODEL 1025 P & H SHOVEL

With 3.2 yard DIPPER. Exclusive P & H Magnetorque. Caterpillar engine, only 2000 hours use, like new.

Contact

RUSH & TOMPKINS CONSTRUCTION CO.
10022—103rd Street, Phone: GA 4-0437
EDMONTON, ALBERTA, CANADA

FOR SALE

1—Bucyrus-Erie 200W Monighan Dragline with Cooper-Bessemer Diesel Engine. Location—Ohio.

2—Lorain 820 Draglines—one with Cat. D-13000 and one with Waukesha 6 WAKD engine. Location—Sydney, Nova Scotia and Hamilton, Ontario.

1—Manitowoc 4500 Dragline with Cummins NVHIS engine. Location—Sydney, Nova Scotia.

WRITE OR PHONE:

HECKETT ENGINEERING CO.
BUTLER, PENNSYLVANIA, U.S.A.

PIPE

Surplus New & Used
FOR SALE, WANTED OR RENT

Call: HYacinth 7-4900

PIPE, VALVES & FITTINGS
PILING • CULVERTS
ASBESTOS-CEMENT PIPE • ALUMINUM PIPE

ALBERT PIPE SUPPLY CO., Inc.
103 VARICK AVE., BROOKLYN 37, N.Y.

ASSOCIATED PIPE & FITTING CO., INC.

PILING PIPE SHELLS MANDREL FITTINGS
"H" BEARING PILE-POINTS AND SLEEVES
TIMBER SPLICERS AND SHOES
CULVERTS CIRCLE ARCH SECTIONAL

262 RUTHERFORD BLVD., CLIFTON, N.J. • PR 3-8400

STEEL PIPE

NEW — STRUCTURAL — RECONDITIONED
VALVES & ALL TYPE FITTINGS
COMPLETE FABRICATION FACILITIES

GREENPOINT PIPE SUPPLY CORP.
341 Stagg Street, Brooklyn 6, N. Y. EV. 6-7200

PILING

SURPLUS NEW and USED — For Sale, Wanted or Rent

H & SHEET STEEL PILING

1400 PCS. BP8, BP10, BP12—BP14—55′ to 60′
3700 PCS. BETH. SP6A 50′, 56′ 48′ & 40′ & 35′
1900 PCS. MP112—12′ 15′ 20′ 25′ 31′ 35′ & 60′
2300 PCS. BETH.—AP3 10, 15′, 20′, 25′, 30′ & 60′
2500 PCS. BETH.—DP2—20′, 25′, 30′, 35′, 40′ & 60′
1200 PCS. ZP38-ZP32—20′, 32′, 36′, 40′, 50′, 60′
600 PCS. ZP27—20′, 26′, 31′, 40′, 45′, 60′
500 PCS. 10′ & 15′ Corrugated Piling

PILING BOUGHT—SOLD—RENTED
STOCKS: N. Y.—BOSTON—BUFFALO
TORONTO—BALTIMORE—JACKSONVILLE
MIAMI—RICHMOND—NEW ORLEANS

DIESEL LOCOMOTIVES & CRANES
12—Gen. Elec. 100, 80, 70, 65, 45, 25, & 23 ton
25 Ton Industrial Loco Crane 60′ Boom

7250′ & 3600′ JOY ELEC AIR COMPRESSORS
Both—2300 V-WN 224C-Radial New 58

R. C. STANHOPE, INC.
60 E. 42nd St. — N. Y. 17, N. Y.
Telephone MU 2-3075 or MU 9-1898

STEEL SHEET PILING

AVAILABLE FOR PROMPT SHIPMENT

Pcs.	*Section*	*Length*	*Location*
130	MP-101	40 to 45 ft.	Indiana
450	MP-116	20 to 60 ft.	Missouri
144	MP-116	24 to 31 ft.	Nebraska
139	MP-112	20 to 22 ft.	Illinois
310	MP-116	20 to 60 ft.	Tennessee
384	MP-115	15 to 60 ft.	Missouri
440	MP-115	15 to 60 ft.	Illinois

CONMACO, INC.
PHONE DRexel 1-3930
804 KANSAS AVE., KANSAS CITY, KANSAS

STEEL SHEET PILING

LARSSEN and ROMBAS Sections

STOCKS AVAILABLE IN:

- Linden, New Jersey
- Ft. Lauderdale, Florida
- Houston, Texas

WESTERN SERVICES CORPORATION
601 E. Linden Ave., Linden, N. J.
MArket 4-4000 — HUnter 6-4000

In Florida Call: Port Everglades Steel Co.
Ft. Lauderdale—JA. 4-6545
In Houston Call: G. Oliver—CA. 4-7234

H & STEEL SHEET PILING

Immediate Shipment—All Sizes
Chicago—Buffalo—Memphis—Cincinnati

WHISLER STEEL PILING CO.
1908 Railway Exchange Bldg., St. Louis 1, Mo.
CHestnut 1-4474

When you need PILING . . . fast

use this section, as many contractors do, as a piling buying directory. It can save you time when you want to know quickly, where to buy good new or used piling.

RAILS-TIES

TRACK ACCESSORIES

RAILS

MIDWEST STEEL CORP.
502 DRYDEN STREET
CHARLESTON, W. VA.

RAILROAD Cross and Switch **TIES**

Promptly from adequate stocks
NEW and USED *(as available)*

GILLIS & COMPANY
134 Breckenridge Lane — Louisville 7, Ky
TW 5-9484

RAILS-TIE PLATES

Frogs & Switches—Track Accessories

W. H. DYER CO., INC.
1811-X Railway Exchange Bldg., St. Louis 1, Mo.
Operating Nationally

FOR SALE

Galion 3 wheel Roller. 12 to 14 ton. Ran approx. 400 days. Diesel Motor. Serial 40979.
1 used McCarter Asphalt Plant Cap. 2 ton.
1 Electric Power Plant operated by 2 Winton Diesel Engines. Ready to work.
5 Used Chain Drive Mack trucks with 5½ yd. Mixers.
Jaeger & Rex Mixers. Cummins 165 H.P. engines.

FS-6908, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

FOR SALE
Allison Torqmatic Transmissions
REBUILT—GUARANTEED
#5630—EUCLID S-18's
#5640—EUCLID TD65-66's
#5640—INT. HARV. PAY HAULER
OTHER MODELS ON REQUEST
TRANS "O" MATIC
STATE HIGHWAY 46, PALISADES PARK, N J.
N. Y. Phone WIsconsin 7-1012

DIAL TELEPHONE $8.95!

Gov't surplus-factory reconditioned. Standard type with coil cord, complete with wire, fully guaranteed. Add $2.00 if 4 prong plug is required. *Write for list. Shipments F.O.B.*

SURPLUS SAVING CENTER
Waymart Dept. ENR-6221 Penna.

SURVEYING INSTRUMENTS

USED • REBUILT • SALE
RENT • REPAIRING

TRANSITS AND LEVELS

New or Rebuilt
Sale or Rent

Headquarters for REPAIRS — any make — Factory Service We will also buy your old instruments or take them in trade.

A complete line of Engineering Instruments and equipment for field or office. Write for catalog NRL 206.

WARREN-KNIGHT CO.
Manufacturers of Transits and Levels
136 No. 12th St., Philadelphia 7, Penna.

ALL MAKES

RE-BUILT
REPAIRS
RENT
REAL EXPERTS

BUFF

69 Dey St., New York WOrth 2-2797

INSTRUMENT REPAIR AND SALES

Midwest distributors for:
- Fennel Instrument Corp. of America
- Buff & Buff Mfg. Co.
- David White Instr. Co.
- Eagle Instrument Co.
- Rolatape, Inc.

PROMPT REPAIR SERVICE
FIFTY YEARS EXPERIENCE
All types Transits and Levels

INSTRUMENT SALES CO.
CHICAGO ILLINOIS RICHMOND
4528 W. Lawrence Ave. TECHNICAL DIVISION
PHONE: Kildare 5-7777 PHONE: 2153

FABULOUS A.A.S.H.O. ROAD TEST VEHICLES, ROAD REPAIR & MAINTENANCE EQUIPMENT

Going Piece by Piece . . . to the Highest Bidders at

PUBLIC AUCTION

WED., JULY 12th—10:30 A.M. (C.D.T.)

ON THE PREMISES OF THE TEST SITE AT

OTTAWA, ILLINOIS

By Order of the National Academy of Sciences!

$1,500,000 TEST VEHICLES

(REPLACEMENT VALUE)

125 Tractors and Trucks; Tandem and Single Axle Diesel Tractors; International, Diamond-T, Mack, Auto Car, White and G.M.C.; Tandem & Single Axle Gas Tractors—Ford, Chevrolet, International, Dodge, G.M.C., and Reo; Flat Beds and Pick Up Trucks—Chevrolet, Ford, Dodge, and I.H.C. ½- to 4-Ton Capacity; 95 Trailers—Flat Bed, Tandem and Single Axle; Dorsey, Alabama, Kingham, Lufkin, Highway and Andrews—16000# to 74000# Capacity.

ROAD MAINTENANCE & REPAIR EQUIPMENT

12 G.M.C. and Ford Single & Tandem Axle Dump Trucks; White 1953 Truck Tractor; Barber-Greene 879A Asphalt Finisher; Caterpillar No. 6 Traxcavator; Front End Loader; Austin Western 88H Motor Grader; Buffalo-Springfield 8-10 Tandem Roller; Gallin 5-8-Ton Tandem Roller; Littleford 700 Trail-O-Patcher; Portable Core Drill; Chicago Pneumatic 125-RG2 Portable Air Compressor; Hydra-Hammer SPHH-CE Self-Propelled Paving Breaker; Vermeer VV-2 Power Ditcher; etc.

$100,000 COST VALUATION OF NEW TRACTOR, TRUCK & TRAILER REPAIR PARTS • UNUSUAL INVENTORY NEW AND RE-CAP TIRES • COMPLETE GARAGE, MAINTENANCE AND REPAIR EQUIPMENT AND TOOLS • BUTLER ALL STEEL PRE-FAB 12′ x 36′ BUILDINGS.

Illustrated Descriptive Circular Mailed on Request

WRITE • WIRE • PHONE

SAMUEL L. WINTERNITZ & CO.

Auctioneers • Liquidators • Appraisers
FIRST NATIONAL BANK BLDG., CHICAGO 3, ILL.
Phone STate 2-5908

HEAVY EXCAVATION EQUIPMENT
LARGE DRAGLINES, SHOVELS, CRANES, ROTARY DRILLS, EUCLID DUMP TRUCKS
FRANK SWABB EQUIPMENT COMPANY, INC.
Hazleton National Bank Building, Hazleton Pa.
Phone GL 5-3658

FOR SALE
Low Voltage Control Cable
60,000 feet. Suitable for communication or instrumentation.
E. M. BOYLES
2700 Wymer St. Boise, Idaho

FOR SALE OR RENT

200 TON AMERICAN MODEL 200-160 GUY DERRICK
50 TON AMERICAN MODEL 3046 STIFFLEG DERRICK
AMERICAN R-15 REVOLVER GANTRY CRANES
200 HP AMERICAN #180 3 DRUM HOIST AND SWINGER
25 TON IND. BH #5 DIESEL LOCOMOTIVE CRANE
45 TON GEN. ELEC. DIESEL ELEC. LOCOS.
25 TON GEN. ELEC. DIESEL ELEC. LOCO.
1 YD. LORAIN L-50 CRANE, NEW 1951.

WHISLER EQUIPMENT CO.
1905 Railway Exchange Bldg., St. Louis 1, Mo.

PROFESSIONAL SERVICES

Cards arranged by areas, states, cities, names — **Additional cards on following pages**

NEW ENGLAND

Goodkind & O'Dea
Consulting Engineers
Design and Supervision
Foundations, Structures, Highways
1214 Dixwell Ave. Hamden, Conn.
610 Bloomfield Ave. Bloomfield, N. J.
325 Spring Street, New York, N. Y.
108 W. Lake Street, Chicago 1, Ill.

John J. Mozzochi and Associates
Civil Engineers
Highways - Airports - Developments
Survey - Design - Inspection
217 Hebron Avenue — 200 Dyer Street
Glastonbury, Conn. — Providence, R. I.

Fay, Spofford & Thorndike, Inc.
Engineers
Industrial Plants — Incinerators
Water Supply, Sewerage, Drainage
Bridges — Express Highways
Port and Terminal Work — Airports
Designs — Investigations
Supervision of Construction
Boston 8, Massachusetts

Jackson & Moreland, Inc.
Jackson & Moreland Int'l., Inc.
Engineers and Consultants
Electrical—Mechanical—Structural
Design and Supervision of Construction
-:- for -:-
Utility, Industrial and Atomic Projects
Surveys—Appraisals—Reports
Technical Publications
Boston — Washington — New York

Chas. T. Main, Inc.
Engineers
Design and Supervision of Construction for Industrial Plants—Electrical, Steam and Hydraulic Engineering—Investigations, Reports, and Appraisals.
Boston, Mass. — Charlotte, N. C.

Metcalf & Eddy
Engineers
Soils, Foundations, Waterworks, Sewage Works, Drainage, Irrigation, Flood Control, Refuse, Industrial Wastes, Airports, Highways, Military Projects, Industrial and Commercial Facilities.
Statler Building, Boston 16,
Massachusetts

Moore Survey & Mapping Corp.
Engineers-Photogrammetrists-Surveyors
Geodetic Control—Construction Layout
Aerial Topographic Surveys—Tax Maps
Hydrographic Surveys—Photogrammetry
29 Grafton Circle—Shrewsbury, Mass.

MIDDLE ATLANTIC

Airways Engineering Corp.
Airports, highways, dams, fuel storage, pipe lines, aerial topographic mapping.
1212-18th St., N.W.,
Washington 6, D. C.
Phone: REpublic 7-8131

Ewin Engineering Corporation
Designers of Port Facilities, Foundations, Industrial Plants, Bridges, Highways, Sewage Disposal and Urban Renewal.
5104 MacArthur Blvd. N.W.
Washington, D. C.
DuPont Plaza Center, Miami 32, Fla.
150 Savannah St. — Mobile, Ala.

Whitman, Requardt & Associates
Engineers—Consultants
Civil—Sanitary—Structural
Mechanical—Electrical
Reports Plans, Supervision, Appraisals
1304 St. Paul St., Baltimore 2, Md.

Baker-Wibberley & Associates, Inc.
Consulting Engineers
Civil, Sanitary, Structural,
Foundations, Soils
49 N. Jonathan St., Hagerstown, Md.
Baltimore, Md. — Waynesboro, Pa.

Louis Berger & Associates
Consulting Engineers
Studies—Design—Supervision
Highways—Structures—Airfields
177 Oakwood Avenue — Orange, N. J.
2nd & Locust Streets — Harrisburg, Pa.
200 S. Main St — Salt Lake City, Utah
8 rue de Neuchatel Geneva, Switzerland
46 Baselerstrasse, Frankfurt, Germany

Joseph S. Ward and Associates
Consulting Soil and Foundation Engineers
Site Investigation, Boring Supervision, Laboratory Soil Testing, Foundation and Pavement Analysis and Design, Construction Supervision, Engineering Reports and Consultation
91 Roseland Avenue — Caldwell, N. J.
Jefferson Building — Phila., Penna

Victor J. Lo Pinto Associates
Consulting Engineers
SOILS - FOUNDATIONS - HIGHWAYS
Investigation - Design - Supervision
Sub Surface Exploration
Laboratory and Field Tests
Land Development Engineering
58 Branchport Ave., Long Branch, N. J.

Albert C. Jones Associates
Consulting Engineers
Private and Municipal Engineering
Sewerage-Sewage Treatment
Water Supply and Distribution
Investigations and Appraisals
Photogrammetric Engineering
Aerial Maps
223 High St. Mount Holly, New Jersey

Edwards and Kelcey
Engineers and Consultants
Traffic — Transportation — Parking
Expressways — Airports — Public Works
Surveys - Reports - Design - Supervision
3 William Street, Newark 2, New Jersey
Boston — Salt Lake City — New York
Providence — Minneapolis

Porter & O'Brien
O. J. PORTER & COMPANY
CONSULTING ENGINEERS
Airports — Highways — Expressways — Buildings — Bridges — Dams — Harbors — Foundations — Stabilization — Pavements
Reports, Designs & Supervision
415 Frelinghuysen Ave., Newark 5, N.J.
4201 Sunset Blvd. Los Angeles 29, Cal.
1421-47th Avenue Sacramento 22, Cal.

Boswell Engineering Co.
Consulting Engineers
Highways, Bridges, Airports, Municipal
Ridgefield Park, N. J.
West Nyack, New York
Salt Lake City, Utah
Anchorage, Alaska

M. C. Tomasetti
Consulting Engineers—Surveyors
Designs, Construction Supervision
Highways—Airfields—Structures
Soils—Foundations—Pavements—Drainage
Materials Investigations
Site Designs, Subdivisions, Surveys
Greenwich, Conn., New Rochelle, N. Y.

B. K. Hough
Consulting Engineer
Soils & Foundation Engineering
Site investigations, soil testing, design analysis for earthworks, foundations and pavements, field inspection, engineering reports, consultation.
121 E. Seneca St. — Ithaca, New York

Clinton Bogert Engineers
Consultants
Clinton L. Bogert — Ivan L. Bogert
Donald M. Ditmars — Robert A. Lincoln
Charles A. Manganaro — William Martin
Water & Sewage Works — Incinerators
Drainage — Flood Control
Highways and Bridges — Airfields
145 E. 32nd St., New York 16, N. Y.

Ammann & Whitney
Consulting Engineers
Design and Supervision of Construction of Bridges, Highways, Expressway, Buildings, Special Structures, Airports and Airport Facilities
111 Eighth Avenue, New York 11, N.Y.
Milwaukee - Washington - Philadelphia
Paris - Athens - Tehran

Blauvelt Engineering Co.
CONSULTING ENGINEERS
Highways,
Bridges,
Reports
New York, N. Y. — Philadelphia, Pa.
Woodbury, N. J. — Crystal Lake, Ill.

Bowe, Albertson & Associates
Engineers
Water and Sewage Works—Industrial Wastes—Refuse Disposal—Valuations—Laboratory Service
75 West St. — 1000 Farmington Ave.
New York 6, N.Y. — W. Hartford 7, Conn.

Brown Engineers
Brown Engineers International
Architects—Engineers—Planners
Airports, Bridges, City Planning, Commercial Buildings, Dams, Highways, Housing, Hydraulics, Hydroelectric Power, Industrial Plants, Ports, Railroads, Sewerage, Transportation Studies, Urban Renewal, Water Supply.
Studies—Design—Management
Supervision of Construction
Coliseum Tower
10 Columbus Circle
New York 19, N. Y.

Buck, Seifert and Jost
Consulting Engineers
Water Supply — Sewerage — Hydraulic Developments—Reports and Valuations, Chemical and Biological Laboratories.
New York City, 112 E. 19th St.

Gibbs & Hill, Inc.
Consulting Engineers
Water, Sewage & Industrial Waste Treatment Works — Roads, Bridges & Railroads—Conventional & Nuclear Power Generation — Electric Transmission & Distribution Systems—Industrial & Communication Facilities.
PENN STATION NEW YORK 1, N.Y.

Hardesty & Hanover
Consulting Engineers
Bridges
  Fixed and Movable
Highways
  Expressways, Thruways
Special Structures
Design, Supervision,
Inspection, Valuation
101 Park Avenue — New York 17

Frederic R. Harris, Inc.
Consulting Engineers
New York, N. Y.
Norwalk, Conn. — New Orleans, La.
Toronto, Canada — The Hague, Holland

Hazen and Sawyer
Engineers
Richard Hazen — Alfred W. Sawyer
H. E. Hudson, Jr.
Water and Sewage Works
Industrial Waste Disposal
Drainage and Flood Control
360 Lexington Ave., New York 17, N.Y.

Howard, Needles, Tammen & Bergendoff
Consulting Engineers
Bridges • Structures • Foundations
Admin. Ser. • Traffic & Parking •
Express Highways • Airports
Kansas City - Cleveland - New York

King & Gavaris
CONSULTING ENGINEERS
Associates:
W. Mack Angas
David Carsen
Dr. G. P. Tschebotarioff
Sidney Zecher
Bridges, Highways, Tunnels
Waterfront Structures, Reports
Investigations, Foundations
Design & Supervision of Construction
41 E. 42nd St., New York 17, N. Y.

Litchfield Whiting Bowne & Assoc.
Engineers—Architects
Sewage, Water, Bridges, Airports, Flood Control, Electrification, Hospitals, Schools, City Planning, Abbatoirs, Highways, Air Conditioning, Industrial Buildings, Military.
8 West 40th St., N. Y. 18, N. Y.
Rome — Tehran — Bangkok

Modern Engineering Corporation
Design—Consulting
62 William Street, New York, N. Y.

Moran, Proctor Mueser & Rutledge
Consulting Engineers
Foundations for Buildings, Bridges and Dams; Tunnels, Bulkheads, Marine Structures; Soil Studies and Tests; Reports, design and supervision.
415 Madison Ave., New York 17, N.Y.
Eldorado 5-4800

Parsons, Brinckerhoff, Quade & Douglas
ENGINEERS
Bridges, Highways, Tunnels, Airports, Subways, Harbor Works, Dams, Canals, Traffic Parking and Transportation Reports, Power, Industrial Buildings, Housing, Sewerage and Water Supply.
165 Broadway — New York 6, N. Y.

E. Lionel Pavlo
Consulting Engineer
Design, Supervision, Reports
Bridges, Highways, Expressways
Marine Structures, Public Works
Industrial Construction, Airports
642 Fifth Ave. — New York 19, N. Y.

Malcolm Pirnie Engineers
Malcolm Pirnie — Carl A. Arenander
Ernest W. Whitlock — Malcolm Pirnie, Jr.
Robert D. Mitchell — Alfred C. Leonard
MUNICIPAL AND INDUSTRIAL
Water Supply—Water Treatment
Sewerage and Waste Treatment
Drainage—Rates—Refuse Disposal
25 West 43rd St., New York 36, N. Y.
3013 Horatio Street, Tampa 9, Fla.

The Pitometer Associates
Engineers
Water Waste Surveys
Trunk Main Surveys
Water Distribution Studies
Water Measurements & Special
Hydraulic Investigations
New York, 50 Church St.

PROFESSIONAL SERVICES

Cards arranged by areas, states, cities, names

Additional cards on preceding and following pages

Alexander Potter Associates

Consulting Engineers

Water Works, Sewerage, Industrial Waste, Hydraulic Works, Reports, Designs, Appraisals.

50 Church St., New York, N. Y.

Praeger-Kavanagh

Engineers

126 East 38th St., New York 16, N. Y.

Seelye Stevenson Value & Knecht

Consulting Engineers

Richard E. Dougherty, Consultant

Airports, Highways, Bridges, Dams Water Supply, Sanitation, Railroads, Piers, Industrial Plants, Reinforced Concrete, Steel, Industrial Waste Disposal, Foundations, Soil Studies, Real Estate Development.

Civil — Mechanical — Electrical

101 Park Avenue New York 17, N. Y.

Severud-Elstad-Krueger-Associates

Consulting Engineers

Structural Design - Supervision
Reports - Buildings - Airports
Special Structures

415 Lexington Ave., New York 17, N.Y.

Singstad & Baillie

Consulting Engineers

Ole Singstad David G. Baillie, Jr.

Tunnels, Subways, Highways
Foundations, Parking Garages

24 State St. New York 4, N. Y.

Frederick Snare Corporation

Engineers—Contractors

Harbor Works, Bridges, Power Plants, Dams, Docks and Terminals.

Difficult and Unusual Foundations A Specialty

233 Broadway, New York City 7

Havana, Cuba Lima, Peru
Bogota, Columbia, Caracas, Venezuela

Steinman, Boynton, Gronquist & London

Consulting Engineers

HIGHWAYS - BRIDGES
STRUCTURES

117 Liberty St., New York 6, N. Y.

Tippetts-Abbett-McCarthy-Stratton

Engineers and Architects

Ports, Harbors, Flood Control, Power Dams, Bridges, Tunnels, Highways, Railroads, Subways, Airports, Traffic, Foundations Water Supply, Sewerage, Reports, Design, Supervision, Consultation.

375 Park Avenue, New York 22, N. Y.

Arnold H. Vollmer Associates

Consulting Engineers

Highways, Parks, Bridges, Municipal Improvements, Public Works, Reports, Surveys, Contract Plans.

25 W. 45th Street, New York 36, N. Y.
Telephone: CIrcle 7-6250

Lawrence S. Waterbury

Consulting Engineer

Bowling Green 9-9298
26 Broadway, New York 4

Keis & Holroyd

Consulting Engineers

Formerly Solomon & Keis
Since 1906

Water Supply, Sewage Disposal, Garbage & Refuse Incineration, Industrial buildings.

Troy, N. Y.

Capitol Engineering Corporation

Consulting Civil Engineers

Dillsburg, Pennsylvania, U.S.A.

Gannett Fleming Corddry & Carpenter, Inc.

ENGINEERS

Dams, Water Works, Sewage, Industrial Wastes & Garbage Disposal, Highways, Bridges & Airports Traffic & Parking — Appraisals, Investigation & Reports.

Harrisburg, Penna.

Branch Offices
Pittsburgh, Pa. Philadelphia, Pa.
Daytona Beach, Fla.

Grof & Myers

Consulting Engineers

Highways — Bridges — Airports
Surveys — Reports — Plans
Construction Supervision

1834 North 4th St. Harrisburg, Pa.

Modjeski and Masters

Consulting Engineers

Bridges and other Structures
Foundations
Highways and Expressways

900 North Sixth St. Harrisburgh, Pa.
Philadelphia - Miami - New Orleans

Albright & Friel Inc.

Consulting Engineers

Water, Sewage, Industrial Wastes and Incineration Problems, City Planning, Highways, Bridges and Airports, Dams, Flood Control, Industrial Buildings, Investigations, Reports, Appraisals and Rates

3 Penn Center Plaza Phila. 2, Pa.

Fridy, Gauker, Truscott & Fridy, Inc.

Architects & Engineers

Water, Sewer, Waste Disposal, Roads, Airports, Power & Lighting, Petroleum Facilities, Hospitals, Schools, Public & Industrial Buildings, Reports, Plans, Supervision, Appraisals.

1321 Arch St. Philadelphia 7, Pa.

Harris-Dechant Associates

Consulting Engineers

Water Supply, Dams, Stream Improvement, Flood Control, Port & Harbor Development; Sanitary & Industrial Wastes; Hydro & Steam Power; Highway Engineering & Design.

Surveys—Reports—Econnmics

123 S. Broad St., Philadelphia 9, Pa.

Justin & Courtney

Consulting Engineers

Joel B. Justin - Neville C. Courtney

Dams and Power Problems, Hydroelectric, River Basin Development, Water Suply, Foundations.

121 South Broad Street
Philadelphia 7, Pa.

Yule, Sticklen, Jordan & McNee

ENGINEERS

Bridges, Highways, Airports
Design, Investigations, Reports
Supervision of Construction
Civil, Structural Mechanical
& Electrical

Cedar Cliff Drive
Camp Hill, Pa.

1225 Vine Street
Philadelphia 7, Pa.

5564 North High Street
Columbus, Oh

Morris Knowles Inc.

Engineers

Water Supply and Purification Sewerage and Sewage Disposal, Valuations, Laboratory, City Planning.

Pittsburgh, Pa.

Pennsylvania Drilling Company

Subsurface Explorations, Grouting, Industrial Water Supply, Mineral Prospecting.
Large Diameter Drilled Shafts, Reports

1205 Chartiers Ave. Pittsburgh 20, Pa.

Swindell-Dressler Corp.

CONSULTING ENGINEERS

Industrial Plants — Waterworks — Sewer Systems — Highways — Dams — Bridges — Surveys — Reports — Design and Construction Supervision

Box 1888 • Pittsburgh 30, Pa.

Michael Baker, Jr., Inc.

Consulting Engineers, Planners & Surveyors; Airport, Highway & Bridge Design; Water & Sewerage; Municipal Engineering; Photo Mapping; City Planning urban Ren. & Redev. Surveys; Soils Lab. Home Office—Rochester, Pa. Br. Off. Jackson, Miss. Charleston, W. Va., Harrisburg, Pa.

Sprague & Henwood, Inc.

Drilling Services

Foundation Investigations, Soil Testing & Test Borings, Grout Hole Drilling & Pressure Grouting, Diamond Core Drilling

Main Office
221 W Olive Street, Scranton, Pa.

Branches:
1009 Western Savings Fund Bldg., Philadelphia, Pa.
11 W. 42nd St., New York, New York
300 Mt. Lebanon Blvd., Suite 100 Pittsburgh 34, Pa.
Box 1446—Grand Junction, Colorado
Nashville, Tennessee
Tucson, Arizona
Buchans, Newfoundland

Frank D. McEnteer's Associates, Inc.

Consulting Engineers

Bridges, Highways, Industrial Plants
Design, Investigations, Surveys

Terminal Building, Clarksburg, W. Va.

SOUTH

Harry Hendon & Associates, Inc.

Engineers

Civil Engineers—Public Utilities
Investigation—Designs
Supervision of Construction

P. O. Box 740A 925 Sligh Blvd.
Birmingham 13, Ala. Orlando, Florida

Palmer and Baker Engineers, Inc.

Consulting Engineers - Architects

Surveys-Reports-Design-Supervision
Consultation

Transportation and Traffic Problems
Tunnels-Bridges-Highways-Airports
Industrial Buildings
Waterfront and Harbor Structures
Graving and Floating Dry Docks
Complete Soils, Materials and Chemical Laboratories

Mobile, Ala New Orleans, La.
Washington, D. C.

Rader and Associates

Engineers - Architects

Sewage Disposal, Water Works, Ports, Airports, Bridges, Highways, Office and Commercial Buildings, Industrial Plants Reports, Investigations, Consultations, Aerial Photography, Photogrammetry

First Natl. Bank Bldg., Miami 32, Fla.

THE CONSULTING ENGINEER

By reason of special training, wide experience and tested ability, coupled with professional integrity, the consulting engineer brings to his client detached engineering and economic advice that rises above local limitations and encompasses the availability of all modern developments in the fields where he practices as an expert.

J. Stephen Watkins

Consulting Engineers

Highways—Bridges—Sewerage
Water Supply—Industrial Plants

446 E. High St., Lexington, Kentucky
2617 Dixie Highway, Louisville, Ky.
107 Hale St., Charleston, W. Va.

Standard Drilling Company

Drilling Services

Foundation Investigations, Soil Testing & Test Borings, Grout Hole Drilling, and Pressure Grouting, Diamond Core Drilling.

P.O. Box 174. Somerset, Kentucky.

Eustis Engineering Company

FOUNDATION AND SOIL
MECHANICS INVESTIGATIONS

Soil Borings *Laboratory Test*
Foundation Analyses *Reports*

3635 Airline Highway
Metairie, Louisiana

Schmidt Engineering Co. Inc.

Consulting Engineers

Investigations, Reports, Designs, Heavy Construction — Dams — Hydroelectric Projects—Foundation Explorations and Treatment—Water and Sewerage Works

Emerson Building Chattanooga, Tenn.
Greater Tenn. Bldg. Knoxville, Tenn.

ETCO Engineers and Associates

Foundation Consultants

Test Borings Laboratory Tests
Recommendations, Design and Supervision

2116 Canada Dry St., Houston 23, Tex.
727 Main St. Baton Rouge, La.
427 Carondelet St., New Orleans 12, La.

Mott Core Drilling Co.

Contractors—Manufacturers

Core Borings for Buildings, Bridges, Foundation Soil Tests, Highways, Pressure Grouting, Dams, Mine Shafts
Mineral Prospecting

Mott Bldg. 830 Eighth Ave.
Huntington, 17, W. Va.

MIDDLE WEST

Alvord, Burdick & Howson

CONSULTING ENGINEERS

Water Works
Water Purification
Floor Relief
Drainage
Sewerage
Sewage Treatment
Power Generation
Appraisals

20 North Wacker Drive, Chicago

Consoer, Townsend & Associates

Consulting Engineers

Sewage treatment, sewers, storm drainage, flood control—Water supply and treatment—Highway and bridges—Airports—Urban renewal—Electric and gas transmission lines—Rate studies, surveys and valuations—Industrial and institutional buildings.

360 East Grand Ave. Chicago 11, Ill.

Erik Floor & Associates, Inc.

Consulting and Design Engineers

Hydroelectric Projects — Dams — Flood Control—Hydraulic Structures—Irrigation — Transmission Lines — Investigations—Reports—Designs

139 N. Clark St. Chicago 2, Ill.

THIS SECTION is available to consulting engineers to contact prospective clients every week or every other week.

PROFESSIONAL SERVICES

Cards arranged by areas, states, cities, names

Additional cards on preceding and following pages

De Leuw, Cather & Company

CONSULTING ENGINEERS

Public Transit Subways
Traffic & Parking Railroad Facilities
Expressways Industrial Plants
Grade Separations Municipal Works
Urban Renewal Port Development

150 North Wacker Drive, Chicago 6
San Francisco New York Boston

Greeley and Hansen

Engineers
Water Supply, Water Purification
Sewerage, Sewage Treatment
Flood Control, Drainage, Refuse Disposal
14 E. Jackson Boulevard
Chicago 4, Illinois

Harza Engineering Co.

Consulting Engineers

Hydroelectric Plants & Dams
Transmission Lines
Flood Control, Irrigation
River Basin Development

400 West Madison Street Chicago 6

Hazelet & Erdal

CONSULTING ENGINEERS
Fixed & Movable Bridges, Expressways,
Industrial Plants, Airports, Dams.
Monadnock Block, Chicago 4, Ill.
Dixie Terminal Bldg., Cincinnati 2, O.
Commerce Bldg., Louisville 2, Ky.
Oding Bldg., Lansing 33, Mich.

Pioneer Service & Engineering Co.

Consulting and Design Engineers
Operations—Purchasing
Construction Management
Public Utilities—Industrials
231 So. La Salle St. Chicago 4

Sargent & Lundy

ENGINEERS
Consultants to the Power Industry
Studies • Design • Supervision
140 South Dearborn Street,
Chicago 3, Ill.

Suhr, Peterson, Peterson & Suhr

Consulting Engineers
REPORTS—PLANS—SUPERVISION
Sewerage, Water Supply, Flood Control
& Drainage, Airports, Roads, Surveys
Fixed & Movable Bridges
130 N. Wells St., Chicago 6, Ill.
P. O. Box 1858, Anchorage, Alaska

Chas. W. Cole & Son

Engineers and Architects
3600 E. Jefferson Blvd.
South Bend, Indiana
2112 W. Jefferson St.
Joliet, Illinois

The Hinchman Corporation

Consulting Engineers
"WORLD-WIDE ACTIVITIES"
Survey • Design • Supervision
Specializing In
Corrosion Control•F.C.C. Certification Tests
Electromagnetic Interference Studies
Francis Palms Bldg., Detroit, Michigan

The H. C. Nutting Company

Testing Engineres—Inspection Service
Foundation Investigation—Test Borings
Soil Mechanics—Sewage Flows
Construction Control—Concrete
Water Waste Survey
4120 Airport Road Cincinnati 26, O.

Havens and Emerson

A. A. Burger, H. H. Moseley, J. W. Avery,
F. S. Palocsay, E. S. Ordway, A. M. Mock,
G. H. Abplanalp, S. H. Sutton
Frank C. Tolles, Consultant
Water, Sewerage, Garbage, Industrial
Wastes, Valuation—Laboratories
Leader Bldg. Woolworth Bldg.
Cleveland 14 New York 7

The Austin Company

Design and Construction
Manufacturing and Process Plants
Newspaper and Broadcasting Bldgs.
Power Plants—Industrial
Industrial Office Buildings and Laboratories
Merchandising Bldgs. & Facilities
Plant Location Surveys

New York CLEVELAND Houston
Chicago Montreal Los Angeles
Detroit Seattle

The Osborn Engineering Co.

DESIGNING-CONSULTING

Industrial Plants Office Buildings
Stadiums Grand Stands Field Houses
Bridges Garages Laboratories
7016 Euclid Ave. Cleveland 3, Ohio

Rackoff Associates

Engineers
Highways, Expressways, Bridges, Sewerage and Water Systems, Fiscal and Master Planning, Investigations, Urban Renewal, Supervision
1033 W. Third Ave., Columbus, Ohio

Slocum & Roberts

Construction Consultants
Heavy Construction Project Investigations, Planning, Estimating & Bidding. Plant Layout & Management
504 E. Pine St. 11820 Edgewater Drive
Alhambra, Calif. Lakewood 7, Ohio

Duke Research Corp.

CONSULTANTS

Concrete Pipe Plants; Equipment, Machine, Cast or Vacuum Process. Mechanical Joints: Concrete or Vitrified, Tylox Rubber, Snap-On "O" Ring or Plastisol.

P. O. Box 403
New Philadelphia, Ohio

Jones, Henry & Williams

Consulting Sanitary Engineers
Water works Sewerage & Treatment
Waste Disposal
2000 W. Central Ave., Toledo 6, Ohio

Toledo Testing Laboratory

Engineers—Chemists

Concrete—Soils—Asphalt
Inspection Research
Tests Development
Foundation Investigation
Borings—Diamond Drilling
Load Tests
Soils Mechanics Laboratory
1810 North 12th St. Toledo 2, Ohio

WEST OF MISSISSIPPI

Heron Engineering Co.

Consulting Engineers
For all types of Aerial Tramways, Cableways, and Suspended Structures
2000 South Acoma St.
Denver 23, Colorado

Stanley Engineering Company *Consulting Engineers*

Hershey Building 208 S. LaSalle St.
Muscatine, Ia. Chicago 4, Ill.

Black & Veatch

Consulting Engineers

Water - Electricity - Sewage - Gas - Industry - Reports, Design, Supervision of Construction, Investigations, Valuation and Rates.

1500 Meadow Lake Parkway
Kansas City 14, Missouri

Burns & McDonnell

Engineers—Architects—Consultants

4600 E. 63rd St. Trafficway
Kansas City 41, Missouri

Russel and Axon

Consulting Engineers
Civil — Sanitary — Structural
Industrial — Electrical
Rate Investigations
408 Olive St. St. Louis 2, Mo.
Municipal Airport, Daytona Beach, Fla.

Sverdrup & Parcel Associates, Inc.

Engineers—Architects
Bridges, Structures and Reports,
Industrial and Power Plant
Engineering
915 Olive St., St. Louis, 1, Mo.
417 Montgomery St., San Francisco
Calif.

Benham Engineering Company

Established in 1909
Design and Consulting Engineers
215 N E 23rd Street
Oklahoma City 5, Oklahoma

Spencer J. Buchanan and Associates, Inc.

Consulting Engineers
Soil Mechanics and Foundation Engineering. Civil Engineering Services Reports, Design and Field Supervision.
310 Varisco Building, Bryan, Texas
TAylor 2-3767

Soil Mechanics Incorporated

Foundation Exploration
and Testing Serices

Site Investigations, Soil Borings, Field and Lab Testing, Load Tests, Reports
310 Varisco Building, Bryan, Texas
TAylor 2-3767

Lockwood, Andrews & Newnam

Consulting Engineers
Navigation Facilities — Public Works
Airports — Earthworks — Roads,
Structural, Mechanical — Electrical
Reports — Design — Supervision
Surveys — Valuations
Corpus Christi—Houston—Victoria,
Texas

FAR WEST

Dames & Moore

Consultants in
Applied Earth Sciences
Soil Mechanics Engineering Geology
Geophysics
Atlanta, Chicago, Honolulu, Houston, Los Angeles, New York, Portland, Salt Lake City, San Francisco, Seattle.

ALWAYS READY

Yes, these consultants are always ready to help you with any problem concerning engineered construction. Call on them with the assurance that you will be receiving the finest of professional advice.

International Engineering Company, Inc.

ENGINEERS
Investigation - Reports - Design
Procurement - Field Engineering
Domestic and Foreign
74 New Montgomery St.
San Francisco 5, California

Jacobs Associates

Consulting Construction Engineers
TUNNELS—DAMS
EARTHMOVING—FOUNDATIONS
Methods, Cost Estimates, Plant Design, Management, Surveys, Engineering Geology, Materials Handling
503 Market St., San Francisco 5, Calif.

Nevada Testing Laboratories, Ltd.

Engineering—Civil—Soils & Foundation Consultants—Field Testing—Soil Borings — Rock Drilling — Materials Field Control—Load Tests—Laboratory Testing—Soils—Concrete—Asphalt
300 W. Boston Ave. Las Vegas, Nev.

INSPECTION & TEST

Johnson Soils Engineering Laboratory

Foundation Design - Highway & Airport Pavements - Construction Control - Load Tests Shear & Consolidation Tests - MOBILE LABORATORIES
193 West Shore Ave., Bogata, N. J.
Bogata-Hubbard 7-4408

Pittsburgh Testing Laboratory

A national service-with complete laboratory and inspection facilities.
Laboratories in principal cities.
Main Office: 1330 Locust St.,
Pittsburgh, Pa

AERIAL SURVEYS

Aerial Map Service Co.

Topographic, Planimetric, Photo Maps for Highways, Mining, Resources, Construction, City Maps, Tax Maps, Photo Geology, Tellurometer Radio Distance Measurements, Triangulation, Electronic Computation.
1016 Madison Ave., Pittsburgh 12, Pa.

American Air Surveys, Inc.

AERIAL TOPOGRAPHIC MAPS &
AERIAL PHOTOS FOR
• Highways • Airports • Power & Pipe Lines • Railroads • Mining • All types construction • Stockpile Inventories
907 Penn Ave. Pittsburgh 22, Pa.
Branches-Manhasset, N.Y.-Atlanta, Ga.

ESTIMATING

Estimators Ltd., Inc.

ACCURATE — CONFIDENTIAL
Professional Construction Estimators
Any Project — Anywhere
Main Office:
347 E. Market St., Long Beach 5, Calif
Phones GArfield 3-0084 NEvada 6-5033
or Cable ESTIMINC

GEOLOGISTS

Geologic Associates

ENGINEERING GEOLOGISTS
Studies and Reports
Foundation Investigations
Specialized Drilling and Sampling
Brentwood, Tennessee
Phone (Nashville) VErnon 2-1748

GEOPHYSICISTS

Alpine Geophysical Associates, Inc.

Geophysicists-Engineers-Oceanographers
Land and Marine Foundation Surveys
Highways-Bridges-Tunnels-Buildings
Consultants-Earthquake-Oceanographic
10 Oak Street 2418 Tangley
Norwood, New Jersey Houston, Texas

Consult these Specialists:

Let them save your time by bringing their broad experience in their specialty to bear on your problems.

ADVERTISERS IN THIS ISSUE

Aetna Casualty & Surety Co. 186
Air Placement Equipment Company 264
Allied Materials Corporation 303
Allis-Chalmers 298-299
Alpha Portland Cement Company 306
Alsynite, Div., of Reichhold Chemicals Inc. 136-137
Aluminum Company of America 252-253
American Bitumuls & Asphalt Co. 146
American Bridge Div., United States Steel Corp. 249
American Cyanimid Company 68
American Electric Power Service Corp. 282
American Hoesch, Inc. 132
American Manganese Steel Div., American Brake Shoe Co. 32-33
American Vitrified Products Company 5
Anchor Post Products, Inc. 277
Arkwright Finishing Division 226
Armco Drainage & Metal Products, Inc. 281
The Asphalt Institute 35-42
Associated Research, Inc. 288
Atlas Powder Co. 184-185
Audio Equipment Co., Inc. 292

Baker-Roos, Inc. 132
Barber-Greene Co. 86-87
Barco Manufacturing Company 246
Bay City Shovels, Inc. 153
The William Bayley Company 243
Bethlehem Steel Co. 191
The Bilco Co. 280
Blaw-Knox Co., Blaw-Knox Equipment Div. 234
Borden Metal Products Co. 78
Bros Incorporated 239
Buck Equipment Corporation 262
Butler Bin Company 284

Cast Iron Pipe Research Association 156-157
Caterpillar Tractor Co., Engine Div. 211
The Central-Reynolds Company 91
The Cerand Corporation 195
Champion Mfg. Co. 112
Charles Machine Works, Inc. 262
Chicago Pneumatic Tool Company 260-261
Clark Equipment Co., Const. Mchy. Div. 235
Clarkeson Engineering Company 178
The Clipper Mfg. Co. 300
James B. Clow & Sons, Inc. 224
Concrete Reinforcing Steel Institute 222
The Concrete Surfacing Machinery Co. 292
Connors Steel Division, H. K. Porter Co., Inc. 96
Crane Carrier Corp., Maxi Div. 293
Cummins Engine Co., Inc. 58-59

D-A Lubricant Company, Inc. 21
Davey Compressor Co. 181
Decatur Engineering Co. 250
The Deming Co. 248
Detroit Diesel Engine Div., General Motors Corp. 16-19
Dewey & Almy Chemical Co. 120
R. E. Dietz Co. 11
F. W. Dodge Corporation 225
Douglas Fir Plywood Association 172-173
Richard Dudgeon Inc. 212

Economy Forms Corp. 250
Ellicott Machine Corporation 238
Englehard Hanovia, Inc., Industrial Diamond Division 218
The Ensign-Bickford Company 203
Esso Standard Oil 148-149
Euclid Div., General Motors Corp. 244-245

A. W. Faber-Castell Pencil Co., Inc. 89
Fate-Root-Heath Co. 189
The Firestone Tire & Rubber Company 23
The Flintkote Company 216; 275
L. B. Foster Co. 107
Foundation Wellpoint Corporation 25

Gardner-Denver Company 14
Geophysical Specialties Company 232
The Goodyear Tire & Rubber Co., Truck Tires Dept. 1
Granco Steel Products Co. 231
Graver Tank and Mfg. Co. 93
Gray Company, Inc. 248
Griffin Wellpoint Corp. 46
Gulf Oil Corporation 94-95
Gunite Concrete & Construction Co. 188
W. & L. E. Gurley 154

Halliburton Company 122
Hamilton Kent Mfg. Co. 116
Harnischfeger Corporation 228-229
Hawkeye Products Corp. 270
B. M. Heede, Inc. 276
Hiller Aircraft Corporation 124
Hose-McCann Telephone Co., Inc. 144
Huber-Warco Company 29
The Hy-Dyanamic 197

Igloo Corporation 130
Industrial Distributors (Sales) Ltd. 8-9
Ingersoll-Rand Company 177
Inland Steel Company 166-167
Inland Steel Products Company 158
International Business Machines Corp. 295
The International Nickel Company, Inc. 28
Iowa Manufacturing Co. 76-77
Ironite Company 282
Irving Subway Grating Co., Inc. 258-259

J & J Marine Diving Co. 132
Jenkins Bros. 44
Johns-Manville Corp. 142
Joy Manufacturing Company 219

Keasbey & Mattison Co. 113-114
Kern Instruments Inc. 175
Kerrigan Iron Works, Inc. 266
The Kinnear Mfg. Co. 214
Koehring Division 128-129
Kohler Co. 127

Larsen Products Corp. 210
Lead Industries Assn. 217
Le Roi Div., Westinghouse Air Brake Co. 199
LeTourneau-Westinghouse Co. 192-193
The Levinson Steel Company 147
Lincoln Engineering Co. 105
Link-Belt Company 247
Link-Belt Speeder Corp. 200-201
Ludlow Corporation 57
Lukens Steel Company 220-221

Macomber, Inc. 4
Macwhyte Company 179
Maintenance, Inc. 254
Manitowoc Engineering Corp. 88; 290
Marion Power Shovel Co. 251
The Master Builders Company 3rd Cov.
Mayo Tunnel & Mine Equipment 212
McDowell Manufacturing Co. 168
W. R. Meadows, Inc. 160
Mearl Chemical Corp. 48
Merriman Bros., Inc. 242
Miller Electric Mfg. Co., Inc. 267
Minnesota Mining & Manufacturing Company 85
Mississippi Glass Co. 209
Mississippi Valley Equipment Co. 159
Mobile Drilling, Inc. 182
Montgomery Elevator Company 250
Moretrench Corporation 165
Mueller Co. 296

National Clay Pipe Manufacturers, Inc. 22
Naylor Pipe Company 205
Neenah Foundry Company 270
Newport News Shipbuilding & Dry Dock Co. 208
Nordberg Manufacturing Company 118-119, 121; 123; 125
Northwest Engineering Co. 3

Owatonna Tool Company 164

Pacific Crane & Rigging Co. 266
Pack Manufacturing Co. 212
The Patent Scaffolding Co., Inc. 278-279
Pennsylvania Pneumatic Concrete Refractories, Inc. 267
Phillips Drill Co. 188
Pittsburgh-Des Moines Steel Company 2nd Cov.
Pittsburgh Steel Products Div. 236-237
Portland Cement Association 66-67
Posey Iron Works, Inc. 283
Frederick Post Co. 176
The Preload Company, Inc. 171
The Prescon Corporation 90
Prestressed Concrete Institute 12-13

Ramset Fastening System 155
Raymond International, Inc. 15
Reda Pump Company 271
Reproduction Engineering Corporation 202
Republic Steel Corporation 268-269
Research Publishing Co. 202
Rex-Spanall, Inc. 183
Richmond Screw Anchor Co., Inc. 198
Rilco Laminated Products, Inc. 274
H. H. Robertson Company 289
The Robinson Clay Products Co. 126
Rodgers Hydraulic, Inc. 283
John A. Roebling's Sons Division, The Colorado Fuel and Iron Corporation 213
Rolatape, Inc. 152
Rubber & Plastics Compound Co., Inc. 20
Rust-Oleum Corporation 309
Joseph T. Ryerson & Sons, Inc. 6-7

Sauerman Bros., Inc. 161
Saxe Welded Connections 134
Servicised Products Corp. 273
Sheffield Div., Armco Steel Corp. 194
Sikorsky Aircraft Div., United Aircraft Corp. 174
Simplex Industrial Forms, Inc. 283
The T. L. Smith Company 110-111
Smith Engineering Works 131
Sonoco Products Company 206-207
Spencer Chemical Co. 133
Spencer, White & Prentis, Inc. 196
Sprague & Henwood, Inc. 204
W. F. Sprengnether Instrument Co., Inc. 230
Stacor Equipment Co. 285
Standard Dry Wall Products, Inc. 240
John W. Stang Corp. 135
Steel Joist Institute 169
Stow Manufacturing Co. 233
Sumo Pumps, Inc. 285
Sylgab Steel & Wire Corp. 265
Symons Clamp & Mfg. Co. 2

The Tapecoat Company 280
Templeton, Kenly & Co. 188
Thermoid Division, H. K. Porter Company, Inc. 30-31
Thew Shovel Co. 24
Thiokol Chemical Corp. 286-287
The Travelers Insurance Co. 34
Tube Turns Division of Chemetron Corp. 162-163

The Union Metal Mfg. Co. 26-27
Unit Crane and Shovel Corp. 215
United States Fidelity & Guaranty Co. 150
U. S. Steel Corp. 99-102; 241; 304-305
Universal Form Clamp Co. 115

Visking Company Div., of Union Carbide Corp. 75

Wagner Electric Corp. 230
Waljohn Waterstop, Inc. 285
Waukesha Motor Co. 187
Weil Pump Company 190
The Weinman Pump Mfg. Co. 288
West Chemical Products Inc. 141
Western Waterproofing Co. 112
Wheeling Corrugating Co. 227
Wild Heerbrugg Instruments, Inc. 10
Hugh B. Williams Mfg. Co. 43
Williams Equip. & Supply Co. 263
Wisconsin Motor Corporation 272
Worthington Corp. 4th Cov.
Worthington Corp. 145

Yeomans Brothers Co. 180

Professional Services 318-320

CLASSIFIED ADVERTISING

F. J. Eberle, Business Mgr.

Employment Opportunities 313, 314
Notices
  Auctions 315, 317
  Proposals 310-312
Equipment
  (Used or Surplus)
  (For Rent, Sales Wanted) 314-317

ENGINEERING NEWS-RECORD

330 West 42 St., New York 36—LOngacre 4-3000

Member

Number of copies of this issue printed 87,976

D. S. ROBERTSON, Advertising Sales Manager
HUGH J. CARLSON, Business Manager
LANG CARPENTIER, Production Manager
JACK NEVINS, Assistant Production Manager

ADVERTISING REPRESENTATIVES

Atlanta, 9—1375 Peachtree St., N.E.,
Robert H. Powell, Jr.

Boston, 16—McGraw-Hill Bldg., Copley Square
C. D. Neulen

Chicago 11—645 North Michigan Ave.
L. H. Hunt, W. G. Payne, Earl S. Moore, Jr.

Cleveland, 13—1164 Illuminating Bldg.,
55 Public Square
H. A. Bergstrom, F. P. DiToro

Dallas, 1—Vaughn Bldg., 1712 Commerce St.,
John Grant

Denver, 2—Tower Building, 1700 Broadway
J. W. Patten

Detroit, 26—856 Penobscot Bldg.
R. I. Mace

Houston, 25—Prudential Bldg.,
Holcombe Blvd.—Joseph C. Page

Los Angeles, 17—1125 W. Sixth St.,
Knox Bourne, S. S. Tiebout

New York, 36—500 5th Ave.
C. D. Neulen, H. T. Olsen
Robert L. Barker

Philadelphia, 3—Six Penn Center Plaza
D. G. Jensen
Patrick Keleher

Pittsburgh, 22—4 Gateway Center
Malcolm Russell

Portland 4, Oregon—Room 445, Pacific Bldg.
Scott Hubbard

St. Louis, 8—Continental Bldg., 3615 Olive St.
E. B. Mingle, Jr.

San Francisco 11—255 California St.
John J. Hernan

OTHER SALES OFFICES:

United Kingdom, Edwin E. Murphy, 34 Dover Street, London W.1—Germany, Austria, Stan Kimes, 85 Westendstrasse, Frankfort/Main, Germany—Switzerland, Italy, France and Belgium, Michael R. Zeynel, 2 Place du Port, Geneva, Switzerland

Editorials

At the Five-Year Mark

Sometimes it's hard to see progress. In many areas of human endeavor it's difficult to measure change. Not so in the building of the nation's 41,000-mile Interstate System of roads. Not if you look at the whole five years since the present federal-aid Highway Act was passed. In a special 12-page report, beginning on p. 60, you can do just that.

It's refreshing to consider where we stand and where we're going after five years of the greatest public works program our nation has known: The Interstate System itself is filling out, of course, as it must after expenditure of $10.4 billion. Benefits of the new highways are not only estimable, but are being realized. Engineering of highways has been revolutionized—with more changes yet to come. Roadbuilding equipment and materials are greatly improved and still improving.

In all, it's been a fabulous five years of roadbuilding, and the years ahead could be more so.

That Fancy Bus

The mobile lounge, now developed for Dulles International Airport, seemed a good idea at first. Air travelers would not have to hike to their planes at the new jet airport that is to serve the nation's capital. On the airfield side of a striking new terminal building, a whole bay of lounges-on-wheels would affix themselves. At flight time, the lounges serving a particular plane would roll out to a service apron, where travelers would walk from lounge to plane, just as you'd walk into the next room. No long walk, no exposure to the outside elements.

At first, the plan sounded like a great improvement over the buses such as haul travelers from terminal to jet plane in London and did haul them at Orly in Paris before the new terminal went into service. One would enter the lounge from the terminal, then enter the plane from the lounge without going out-of-doors, without going up or down any steps. The lounge would be attractive, comfortable inside. And it was figured that each one would cost about $100,000.

But now that the lounge is developed, it looks less like a good idea. For the privilege of never setting foot on the pavement or climbing a flight of stairs to the plane door, travelers in and out of Dulles International will ride a vehicular monstrosity that looks like the top deck of a small ferry boat—on wheels. (If you missed the pictures of it be sure to see the mobile lounge inside and out in ENR June 8, p. 18).

It has been reported that instead of the estimated $100,000, each mobile lounge will cost $240,000. And that's after a $75,000 development contract (reported to have over-run 100%) has delivered the prototype vehicle, the first of 20 planned.

Nineteen lounges at $240,000 each; one at close to a million-and-a-half dollars. Rough as the arithmetic may be, the Federal Aviation Agency, owner of the field, may wind up with a $6-million investment in mobile lounges. To give this figure some perspective: The long, elaborate terminal building the lounges are to serve—an Eero Saarinen-Ammann & Whitney design with cable-hung roof—is to cost about $12.5 million. Now $6 million would buy a couple of hundred $30,000 buses. Some $3⅓ million could be saved by buying 40 buses instead of the 19 mobile lounges still to come. And that's just first cost.

Such thoughts as these may right now be weighing heavily on the present Administrator of the FAA. But his predecessor in office committed him to the mobile lounges—perhaps irrevocably. Mobile lounges it apparently will be. And they'll probably work just fine. Those who will ride these conveyances at the national airport will be spared exposure to the elements and the exertion of that usual walk up the open stairway to the plane door. They'll get no exercise either, just strain of a sort, from carrying their taxpayer-burden, the cost of all that luxury.

The Rules of the Game

"Pirating" of personnel—top technical and executive personnel—is a growing problem according to an article in Fortune magazine for June. "Raiding" expeditions conducted by aggressive recruiters are hurting many companies; the talent competition has become so fierce that some professional societies' conventions have had regular recruiters' sideshows. Companies reportedly are shielding their key men from temptation by not sending them to conventions.

Temporarily overcome with sympathy for companies that lose good men, one might be moved by their protests against "pirating." Some go so far as to declare it an unethical business practice. And some, according to Fortune, have secret agreements not to hire one another's personnel.

More serious reflection shows up the hypocrisy. Many of the same management men who preach the glories of free enterprise apparently are afraid to play the game according to the rules. Collusive agreements banning the free movement of personnel—not unheard of among employers of engineers in construction—are just as much a denial of free enterprise as is price fixing. (They also skate dangerously close to the antitrust laws.) Use of such prejudicial terms as "pirating," "raiding" and "body-snatching" constitutes a disingenuous attempt to discredit those who take advantage of the opportunities for change and advancement afforded by a free society.

You can't tee the ball up in the rough and call the game golf; you can't deliberately obstruct the free market for selfish advantage and call the system free enterprise.

As in Charlotte today . . .

Where there's progress . . . there's POZZOLITH concrete

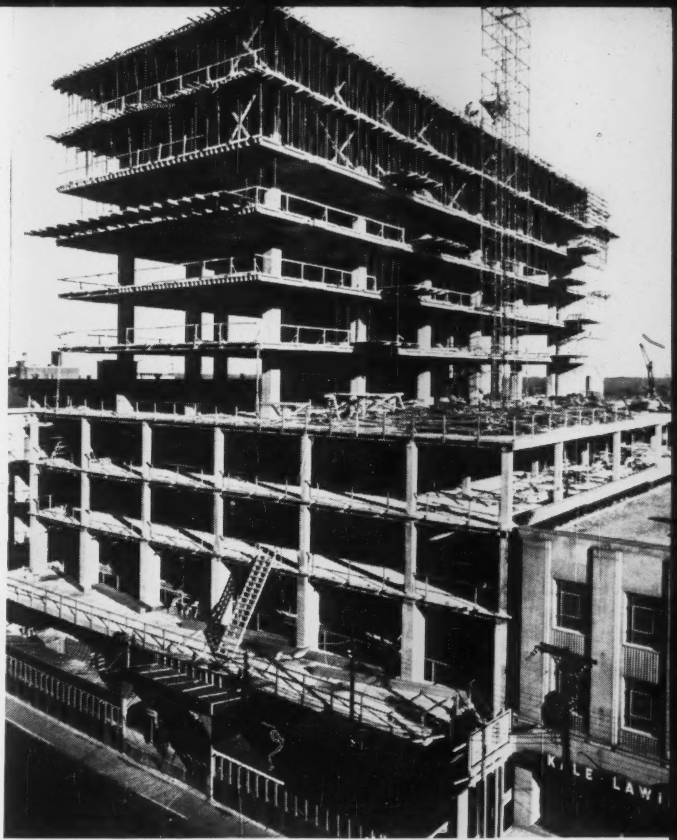
The men who designed and built these outstanding, modern structures specified and used POZZOLITH to assure concrete of superior architectural and structural quality at lowest possible cost.

Over the years—in cities throughout the world—where careful attention is given to concrete performance and economies, the use of POZZOLITH is increasing steadily. Over 230 million cubic yards of POZZOLITH concrete have been placed to date . . . a significant proof-of-performance record.

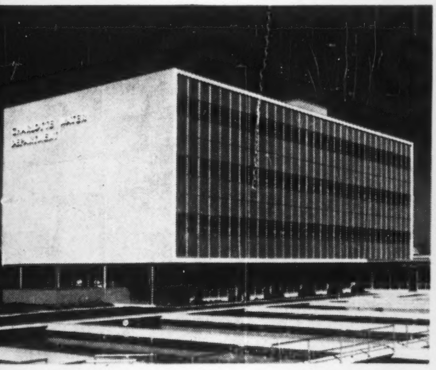
For *your* job . . . with *your* materials—POZZOLITH concrete is best. Neither plain concrete nor concrete with any other admixture can match the results you'll get with POZZOLITH.

On current or future concrete projects, the local Master Builders field man will welcome discussing your requirements. Call him in. He's at your service—backed by the Master Builders research and engineering staff—unexcelled in the field of concrete technology. Write us for full information.

The Master Builders Company
Division of American-Marietta Company
Cleveland 18, Ohio
World-wide manufacturing and service facilities

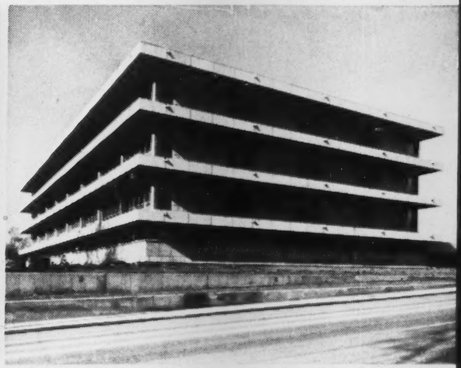


CUTTER OFFICE BUILDING • Owner: Cutter Realty Co., Inc. • Architect: Cameron Associates, Charlotte—Albert B. Cameron, AIA • Structural Engineer: W. H. Gardner, Jr. & Associates, Durham • General Contractor: J. L. Coe Construction Co., Inc., Charlotte • POZZOLITH Ready-Mix Concrete: Concrete Supply Co., Charlotte.



HOSKINS FILTER PLANT, Water Dept., City of Charlotte • Engineers and Architects: J. N. Pease & Co. • General Contractor: Rea Construction Co. • POZZOLITH Ready-Mix Concrete: Concrete Supply Co.—all of Charlotte.

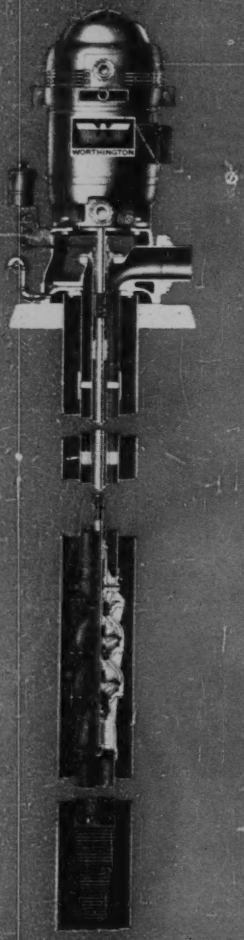
CENTRAL YMCA • Owner: Charlotte YMCA • Architect and Engineer: Walter Hook Associates • General Contractor: Rea Construction Co. • POZZOLITH Ready-Mix Concrete: Concrete Supply Co.—all of Charlotte.



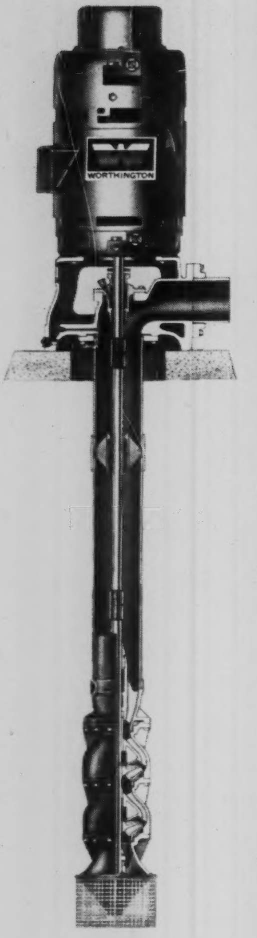
MECKLENBURG COUNTY OFFICE BUILDING • Architect: Sloan & Wheatley, Charlotte • Structural Engineer: W. H. Gardner, Jr. & Associates, Durham • General Contractor: McDevitt & Street Co., Charlotte • POZZOLITH Ready-Mix Concrete: Concrete Supply Co., Charlotte.

MASTER BUILDERS®
POZZOLITH*

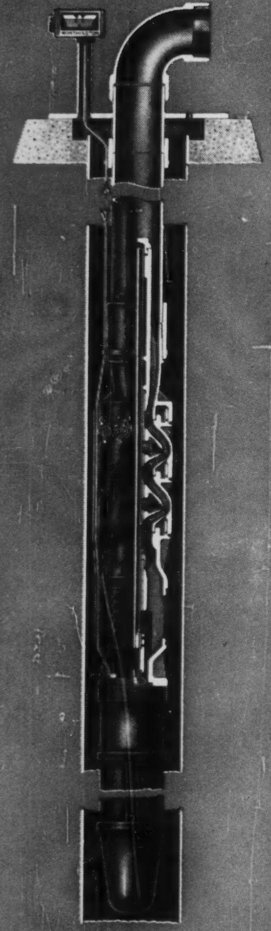
**POZZOLITH is a registered trademark of The Master Builders Co. for its ingredient for concrete which provides maximum water reduction, controls rate of hardening and increases durability.*



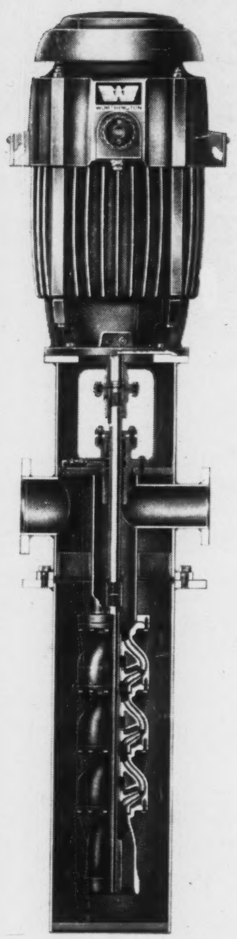
UHF WELL PUMPS for any industrial or municipal shallow or deep well task.



UHF VERTICAL INDUSTRIAL PUMPS with special design for industrial service.



UHF SUBMERSIBLES for concealed, quiet installations and special deep well applications.



UHF CAN PUMPS for handling critical NPSH problems and simplifying installations.

4 TYPES–4 ADVANTAGES–4% BETTER

These Worthington UHF vertical pumps are up to four percent more efficient. They have four basic advantages. They come in four basic types. Certainly, you may find at least one reason to send for one or more of the bulletins available.

The 4% more efficiency cuts operating costs. For example, if UHF design gave you as little as 1% increase in average efficiency during an 8,000-hour year, you would save $800 in power on a 500 hp pump.

Why is a UHF pump more efficient? Careful design gives them unexceeded and frequently unequalled peak efficiency. (We will certify performance.) This peak efficiency alone may cut your power costs. But most important, the UHF pump efficiency curve is broader. Therefore, the pump maintains a much higher average efficiency when it operates away from peak during normal system fluctuations in capacity and head.

The four basic advantages of UHF pumps are behind the increasing specification of them for installations where there are suction and/or space problems. First, the vertical pump saves valuable floor space. Second, it eliminates suction piping, suction valves and reduces expensive dry pit and foundation costs. Third, it provides a simple solution to any suction problem, because these pumps are always primed. Fourth, it is uniquely adaptable regarding length, discharge location and changing conditions. Pressure and capacity can be easily altered by adding or removing stages.

We believe that an installation built with any of the four basic UHF pump types shown here will cost significantly less to construct and to operate. Ask your Worthington representative listed in the Yellow Pages for bulletins on them. Or write Worthington Corporation, Dept. 24-7, Harrison, N. J. In Canada, Worthington (Canada) Ltd., Brantford, Ontario.

WORTHINGTON

PRODUCTS THAT WORK FOR YOUR PROFIT